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THE NEW
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AND
DICTIONARY

A LIBRARY OF UNIVERSAL KNOWLEDGE AND AN UNABRIDGED DICTIONARY OF THE ENGLISH LANGUAGE UNDER ONE ALPHABET

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(Formerly Editor-in-Chief of the International Cyclopedia)

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SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(-) is the mark dividing words respelt phonetically into syllables; (′), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā	mate, fate, fail, aye	*māt, fāt, fāl, ā.*
ă	mat, fat	*măt, făt.*
â	far, calm, father	*fâr, kâm, fâ′thėr.*
ä	care, fair	*cär, fär*
aw	fall, laud, law	*fawl, lawd, law.*
ē	mete, meat, feet, free	*mēt, mēt, fēt, frē.*
ĕ	met, bed	*mĕt, bĕd.*
ė	her, stir, heard, cur	*hėr, stėr, hėrd, kėr.*
ī	pine, ply, height	*pīn, plī, hīt.*
ĭ	pin, nymph, ability	*pĭn, nĭmf, ă-bĭl′ĭ-tĭ.*
ō	note, toll, soul	*nōt, tōl, sōl.*
ŏ	not, plot	*nŏt, plŏt.*
ô	move, smooth	*môv, smôth.*
õ	Goethe (similar to *e* in her)	*gö′teh.*
ow	noun, bough, cow	*nown, bow, kow.*
oy	boy, boil	*boy, boyl.*
ū	pure, dew, few	*pūr, dū, fū.*
ŭ	bud, come, tough	*bŭd, kŭm, tŭf.*
û	full, push, good	*fûl, púsh, gûd.*
ü	French plume, Scotch guid	*plüm, güd.*
ch	chair, match	*chär, măch.*
ċh	German buch, Heidelberg, Scotch loch (guttural)	*bôċh, hī′dėl-bĕrċh, lŏċh.*
g	game, go, gun	*gām, gō, gŭn.*
j	judge, gem, gin	*jŭj, jĕm, jĭn.*
k	king, cat, cot, cut	*kĭng, kăt, kŏt, kŭt.*
s	sit, scene, cell, city, cypress	*sĭt, sēn, sĕl, sĭt′ĭ, sī′prĕs.*
sh	shun, ambition	*shŭn, ăm-bĭsh′ŭn.*
th	thing, breath	*thĭng, brĕth.*
th	though, breathe	*thō, brēth.*
z	zeal, maze, muse	*zēl, māz, mūz.*
zh	azure, vision	*ăzh′ėr, vĭzh′ŭn.*

ABBREVIATIONS USED IN THIS WORK.

a., *or* adj	adjective
A.B	Bachelor of Arts
abbr	abbreviation, abbreviated
abl. *or* abla.	ablative
Abp	Archbishop
abt	about
Acad	Academy
acc. *or* ac.	accusative
accom	accommodated, accommodation
act	active
A.D.	in the year of our Lord [*Anno Domini*]
Adjt	Adjutant
Adm	Admiral
adv. *or* ad.	adverb
A. F	Anglo-French
Ag	Silver [*Argentum*]
agri	agriculture
A. L	Anglo-Latin
Al	Aluminium
Ala	Alabama
Alb	Albanian
alg	algebra
A.M	before noon [*ante meridiem*]
A.M	Master of Arts
Am	Amos
Amer	America, -n
anat	anatomy, anatomical
anc	ancient, anciently
AN. M.	in the year of the world [*Anno Mundi*
anon	anonymous
antiq	antiquity, antiquities
aor	aorist, -ic
app	appendix
appar	apparently
Apr	April
Ar	Arabic
arch	architecture
archæol	archæology
arith	arithmetic
Ariz	Arizona
Ark	Arkansas
art	article
artil	artillery
AS	Anglo-Saxon
As	Arsenic
Assoc	Association
asst	assistant
astrol	astrology
astron	astronomy
attrib	attributive
atty	attorney
at. wt	atomic weight
Au	Gold [*Aurum*]
A.U.C	in the year of the building of the city (Rome) [*Annourbis conditœ*]
Aug	August
aug	augmentative
Aust	Austrian
A. V	authorized version [of Bible, 1611]
avoir	avoirdupois
B	Boron
B	Britannic
b	born
Ba	Barium
Bart	Baronet
Bav	Bavarian
bl.; bbl.	barrel; barrels
B.C	before Christ
B.C.L.	Bachelor of Civil Law
B.D.	Bachelor of Divinity
bef	before
Belg	Belgic
Beng	Bengali
Bi	Bismuth
biog	biography, biographical
biol	biology
B.L	Bachelor of Laws
Bohem	Bohemian
bot	botany, botanical
Bp	Bishop
Br	Bromine
Braz	Brazilian
Bret	Breton
Brig	Brigadier
Brit	British, Britannica
bro	brother
Bulg	Bulgarian
bush	bushel, bushels
C	Carbon
c	century
Ca	Calcium
Cal	California
Camb	Cambridge
Can	Canada
Cant	Canterbury
cap	capital
Capt	Captain
Card	Cardinal
carp	carpentry
Cath	Catholic
caus	causative
cav	cavalry
Cd	Cadmium
Ce	Cerium
Celt	Celtic
cent	central
cf	compare [*confer*]
ch *or* chh.	church

ABBREVIATIONS.

Chal	Chaldee
chap	chapter
chem	chemistry, chemical
Chin	Chinese
Chron	Chronicles
chron	chronology
Cl	Chlorine
Class	Classical [= Greek and Latin]
Co	Cobalt
Co	Company
co	county
cog	cognate [with]
Col	Colonel
Col	Colossians
Coll	College
colloq	colloquial
Colo	Colorado
Com	Commodore
com	commerce, commercial
com	common
comp	compare
comp	composition, compound
compar	comparative
conch	conchology
cong	congress
Congl	Congregational
conj	conjunction
Conn *or* Ct.	Connecticut
contr	contraction, contracted
Cop	Coptic
Cor	Corinthians
Corn	Cornish
corr	corresponding
Cr	Chromium
crystal	crystallography
Cs	Cæsium
ct	cent
Ct. *or* Conn.	Connecticut
Cu	Copper [*Cuprum*]
cwt	a hundred weight
Cyc	Cyclopedia
D	Didymium
D. *or* Dut.	Dutch
d	died
d. [l. s. d.]	penny, pence
Dan	Daniel
Dan	Danish
dat	dative
dau	daughter
D. C.	District of Columbia
D.C.L.	Doctor of Civil [or Common] Law
D.D.	Doctor of Divinity
Dec	December
dec	declension
def	definite, definition
deg	degree, degrees
Del	Delaware
del	delegate, delegates
dem	democratic
dep	deputy
dep	deponent
dept	department
deriv	derivation, derivative
Deut	Deuteronomy
dial	dialect, dialectal
diam	diameter
Dic	Dictionary
diff	different, difference
dim	diminutive
dist	district
distrib	distributive
div	division
doz	dozen
Dr	Doctor
dr	dram, drams
dram	dramatic
Dut. *or* D.	Dutch
dwt	pennyweight
dynam *or* dyn	dynamics
E	Erbium
E. *or* e	East, -ern, -ward
E. *or* Eng.	English
Eccl	Ecclesiastes
eccl. *or* eccles	ecclesiastical [affairs]
ed	edited, edition, editor
e.g	for example [*ex gratia*]
E. Ind. *or* E. I.	East Indies, East Indian
elect	electricity
Emp	Emperor
Encyc	Encyclopedia
Eng. *or* E.	English
engin	engineering
entom	entomology
env. ext	envoy extraordinary
ep	epistle
Eph	Ephesians
Episc	Episcopal
eq. *or* =	equal, equals
equiv	equivalent
esp	especially
Est	Esther
estab	established
Esthon	Esthonian
etc	and others like [*et cetera*]
Eth	Ethiopic
ethnog	ethnography
ethnol	ethnology
et seq	and the following [*et sequentia*]
etym	etymology
Eur	European
Ex	Exodus
exclam	exclamation
Ezek	Ezekiel
Ezr	Ezra
F	Fluorine
F. *or* Fahr.	Fahrenheit
f. *or* fem	feminine
F. *or* Fr	French
fa	father
Fahr. *or* F.	Fahrenheit
far	farriery
Fe	Iron [*Ferrum*]
Feb	February
fem *or* f.	feminine
fig	figure, figuratively
Fin	Finnish
F.—L.	French from Latin
Fla	Florida
Flem	Flemish
for	foreign
fort	fortification
Fr. *or* F.	French
fr	from

freq	frequentative
Fris	Frisian
ft	foot, feet
fut	future
G. *or* Ger	German
G	Glucinium
Ga	Gallium
Ga	Georgia
Gael	Gaelic
Gal	Galatians
gal	gallon
galv	galvanism, galvanic
gard	gardening
gen	gender
Gen	General
Gen	Genesis
gen	genitive
Geno	Genoese
geog	geography
geol	geology
geom	geometry
Ger	German, Germany
Goth	Gothic
Gov	Governor
govt	government
Gr	Grand, Great
Gr	Greek
gr	grain, grains
gram	grammar
Gr. Brit	Great Britain
Gris	Grisons
gun	gunnery
H	Hegira
H	Hydrogen
h	hour, hours
Hab	Habakkuk
Hag	Haggai
H. B. M.	His [or Her] Britannic Majesty
Heb	Hebrew, Hebrews
her	heraldry
herpet	herpetology
Hg	Mercury [*Hydrargyrum*]
hhd	hogshead, hogsheads
Hind	Hindustani, Hindu, or Hindi
hist	history, historical
Hon	Honorable
hort	horticulture
Hos	Hosea
Hung	Hungarian
Hydros	Hydrostatics
I	Iodine
I.; Is	Island ; Islands
Icel	Icelandic
ichth	ichthyology
Ida	Idaho
i.e.	that is [*id est*]
Ill	Illinois
illus	illustration
impera *or* impr	imperative
impers	impersonal
impf *or* imp	imperfect
impf. p. *or* imp	imperfect participle
improp	improperly
In	Indium
in	inch, inches
incept	inceptive
Ind	India, Indian
Ind	Indiana
ind	indicative
indef	indefinite
Indo-Eur	Indo-European
inf	infantry
inf *or* infin	infinitive
instr	instrument, -al
int	interest
intens	intensive
interj. *or* int	interjection
interrog	interrogative pronoun
intr. *or* intrans	intransitive
Io	Iowa
Ir	Iridium
Ir	Irish
Iran	Iranian
irr	irregular, -ly
Is	Isaiah
It	Italian
Jan	January
Jap	Japanese
Jas	James
Jer	Jeremiah
Jn	John
Josh	Joshua
Jr	Junior
Judg	Judges
K	Potassium [*Kalium*]
K	Kings [in Bible]
K	king
Kan	Kansas
Kt	Knight
Ky	Kentucky
L	Latin
L	Lithium
l. [l. s. d.], *or* £	pound, pounds [sterling]
La	Lanthanium
La	Louisiana
Lam	Lamentations
Lang	Languedoc
lang	language
Lap	Lapland
lat	latitude
lb.; llb. *or* lbs	pound ; pounds [weight]
Let	Lettish
Lev	Leviticus
LG	Low German
L.H.D	Doctor of Polite Literature
Lieut	Lieutenant
Lim	Limousin
Lin	Linnæus, Linnæan
lit	literal,-ly
lit	literature
Lith	Lithuanian
lithog	lithograph, -y
LL	Late Latin, Low Latin
LL.D	Doctor of Laws
long	longitude
Luth	Lutheran
M	Middle
M	Monsieur
m	mile, miles
m. *or* masc	masculine
M.A	Master of Arts
Macc	Maccabees
mach	machinery
Mag	Magazine

Maj	Major
Mal	Malachi
Mal	Malay, Malayan
manuf	manufacturing, manufacturers
Mar	March
masc *or* m.	masculine
Mass	Massachusetts
math	mathematics, mathematical
Matt	Matthew
M.D.	Doctor of Medicine
MD	Middle Dutch
Md	Maryland
ME	Middle English, or Old English
Me	Maine
mech	mechanics, mechanical
med	medicine, medical
mem	member
mensur	mensuration
Messrs. *or* MM	Gentlemen, Sirs
metal	metallurgy
metaph	metaphysics, metaphysical
meteor	meteorology
Meth	Methodist
Mex	Mexican
Mg	Magnesium
M.Gr	Middle Greek
MHG	Middle High German
Mic	Micah
Mich	Michigan
mid	middle [voice]
Milan	Milanese
mid. L. *or* ML.	Middle Latin, Mediæval Latin
milit. *or* mil.	military [affairs]
min	minute, minutes
mineral	mineralogy
Minn	Minnesota
Min. Plen.	Minister Plenipotentiary
Miss	Mississippi
ML. *or* mid. L.	Middle Latin, Mediæval Latin
MLG	Middle Low German.
Mlle	Mademoiselle
Mme	Madam
Mn	Manganese
Mo	Missouri
Mo	Molybdenum
mod	modern
Mont	Montana
Mr	Master [Mister]
Mrs	Mistress [Missis]
MS.; MSS.	manuscript; manuscripts
Mt	Mount, mountain
mus	music
MUS. DOC.	Doctor of Music
myth	mythology, mythological
N.	Nitrogen
N. *or* n.	North, -ern, -ward
n	noun
n *or* neut.	neuter
Na	Sodium [*Natrium*]
Nah	Nahum

N. A., *or* N. Amer.	North America, -n
nat	natural
naut	nautical
nav	navigation, naval affairs
Nb	Niobium
N. C. *or* N. Car.	North Carolina
N. D.	North Dakota
Neb	Nebraska
neg	negative
Neh	Nehemiah
N. Eng	New England
neut *or* n.	neuter
Nev	Nevada
N.Gr.	New Greek, Modern Greek
N. H	New Hampshire
NHG	New High German [German]
Ni	Nickel
N. J.	New Jersey
NL	New Latin, Modern Latin
N. Mex.	New Mexico
N. T., *or* N. Test.	New Testament
N. Y.	New York [State]
nom	nominative
Norm. F.	Norman French
North. E.	Northern English
Norw.	Norwegian, Norse
Nov	November
Num	Numbers
numis	numismatics
O	Ohio
O	Old
O	Oxygen
Obad	Obadiah
obj	objective
obs. *or* †	obsolete
obsoles	obsolescent
O.Bulg	Old Bulgarian or Old Slavic
Oct	October
Odontog	odontography
OE	Old English
OF *or* O. Fr.	Old French
OHG	Old High German
Ont	Ontario
opt	optics, optical
Or	Oregon
ord	order
ord	ordnance
org	organic
orig	original, -ly
ornith	ornithology
Os	Osmium
OS.	Old Saxon
O. T., *or* O. Test.	Old Testament
Oxf	Oxford
oz	ounce, ounces
P	Phosphorus
p.; pp	page; pages
p., *or* part.	participle
Pa. *or* Penn.	Pennsylvania
paint	painting
palæon	palæontology
parl	parliament
pass	passive

ABBREVIATIONS.

pathol *or* path	pathology
Pb	Lead [*Plumbum*]
Pd	Palladium
Penn *or* Pa.	Pennsylvania
perf	perfect
perh.	perhaps
Pers	Persian, Persic
pers	person
persp	perspective
pert	pertaining [to]
Pet	Peter
Pg. *or* Port.	Portuguese
phar	pharmacy
PH.D	Doctor of Philosophy
Phen	Phenician
Phil	Philippians
Philem	Philemon
philol	philology, philological
philos. *or* phil	philosophy, philosophical
phonog	phonography
photog	photography
phren	phrenology
phys	physics, physical
physiol	physiology, physiological
Pied	Piedmontese
Pl	Plate
pl. *or* plu	plural
Pl. D	Platt Deutsch
plupf	pluperfect
P.M	afternoon [*post meridiem*]
pneum	pneumatics
P. O	Post-office
poet	poetical
Pol	Polish
pol econ	political economy
polit	politics, political
pop	population
Port. *or* Pg.	Portuguese
poss	possessive
pp	pages
pp	past participle, perfect participle
p. pr	present participle
Pr. *or* Prov.	Provençal
pref	prefix
prep	preposition
Pres	President
pres	present
Presb	Presbyterian
pret	preterit
prim	primitive
priv	privative
prob	probably, probable
Prof	Professor
pron	pronoun
pron	pronunciation, pronounced
prop	properly
pros	prosody
Prot	Protestant
Prov. *or* Pr.	Provençal
Prov	Proverbs
prov	province, provincial
Prov. Eng.	Provincial English
Prus	Prussia, -n
Ps	Psalm, Psalms
psychol	psychology

pt	past tense
pt	pint
Pt	Platinum
pub	published, publisher, publication
pwt	pennyweight
Q	Quebec
qt	quart
qtr	quarter [weight]
qu	query
q.v.	which see [*quod vide*]
R	Rhodium
R	River
Rb.	Rubidium
R. Cath	Roman Catholic
rec. sec	recording secretary
Ref	Reformed
refl	reflex
reg	regular, -ly
regt	regiment
rel. pro. *or* rel	relative pronoun
repr	representing
repub	republican
Rev	Revelation
Rev	The Reverend
Rev. V	Revised Version
rhet	rhetoric, -al
R. I	Rhode Island
R. N	Royal Navy
Rom	Roman, Romans
Rom	Romanic or Romance
Rom. Cath. Ch. *or* R. C. Ch	Roman Catholic Church
r.r	railroad
Rt. Rev	Right Reverend
Ru	Ruthenium
Russ	Russian
r.w	railway
S	Saxon
S	Sulphur
s	second, seconds
s. [l. s. d.]	shilling, shillings
S. *or* s	South, -ern, -ward
S. A. *or* S. Amer.	South America, -n
Sam	Samaritan
Sam	Samuel
Sans, *or* Skr	Sanskrit
Sb	Antimony [*Stibium*]
s.c	understand, supply, namely [*scilicet*]
S. C. *or* S. Car	South Carolina
Scand	Scandinavian
Scot	Scotland, Scotch
scr	scruple, scruples
Scrip	Scripture [s], Scriptural
sculp	sculpture
S. D	South Dakota
Se	Selenium
sec	secretary
sec	section
Sem	Semitic
Sep	September
Serv	Servian
Shaks.	Shakespeare
Si	Silicon

ABBREVIATIONS.

Sic	Sicilian
sing	singular
sis	sister
Skr. *or* Sans	Sanskirt
Slav	Slavonic, Slavic
Sn	Tin [*Stannum*]
Soc	Society
Song Sol	Song of Solomon
Sp	Spanish
sp. gr	specific gravity
sq	square
Sr	Senior
Sr	Strontium
St.: Ste.	Saint
St.	street
stat	statute
S.T.D.	Doctor of Sacred Theology
subj	subjunctive
suf	suffix
Su. Goth	Suo-Gothic
superl	superlative
Supp	Supplement
Supt	Superintendent
surg	surgery, surgical
Surv	surveying
Sw	Swedish
Swab	Swabian
sym	symbol
syn	synonym, -y
Syr	Syriac, Syrian
t	town
Ta	Tantalum
Tart	Tartar
Te	Tellurium
technol	technology
teleg	telegraphy
Tenn	Tennessee
term	termination
terr	territory
Teut	Teutonic
Tex	Texas
Th	Thorium
theat	theatrical
theol	theology, theological
therap	therapeutics
Thess	Thessalonians
Ti	Titanium
Tim	Timothy
Tit	Titus
Tl	Thallium
toxicol	toxicology
tp	township
tr. *or* trans.	transitive
transl	translation, translated
trigon	trigonometry
Turk	Turkish
typog	typography, typographical
U	Uranium
ult	ultimate, -ly
Unit	Unitarian
Univ	Universalist
Univ	University
U. Presb	United Presbyterian
U. S.	United States
U. S. A.	United States Army
U. S. N.	United States Navy
Ut	Utah
V	Vanadium
v	verb
Va	Virginia
var	variant [word]
var	variety of [species]
Ven	Venerable
Venet	Venetian
vet	veterinary
v. i. *or* v. intr	verb intransitive
vil	village
viz	namely, to-wit [*videlicet*]
v. n	verb neuter
voc	vocative
vol	volume
vols	volunteers
Vt	Vermont
v. tr	verb transitive
W	Tungsten [*Wolfram*]
W	Welsh
W. *or* w	West, -ern, -ward
Wal	Walachian
Wall	Walloon
Wash	Washington
Westph	Westphalia, -n
W. Ind. *or* W. I.	West Indies, West Indian
Wis	Wisconsin
wt	weight
W. Va	West Virginia
Wyo	Wyoming
Y	Yttrium
yd	yard
yr	year
Zech	Zechariah
Zeph	Zephaniah
Zn	Zinc
zool	zoology, zoological
Zr	Zirconium

See also ABBREVIATIONS in Vol. I.

IMPERIAL ENCYCLOPEDIA AND DICTIONARY.

EXALT, v. *ĕgz-awlt'* [F. *exalter*, to exalt—from L. *exaltārĕ*, to raise, to elevate—from *ex*, out of; *altus*, high: It. *esaltare*]: to raise high; to elevate in power, wealth, dignity, or fame; to elevate the tone of, as the voice; to magnify; to extol. Exal'ting, imp. Exal'ted, pp. Exaltation, n. *ĕgz'awl-tā-shŭn* [F.—L.]: the act of exalting; elevated state; state of greatness or dignity. Exal'tedness, n. Exalter, n. *-ĕr*, one who exalts.—Syn. of 'exalt': to raise; elevate; erect; hoist; lift; heighten; dignify; promote; glorify; inspire; elate.

EXAMINE, v. *ĕgz-ăm'ĭn* [F. *examiner*—from L. *examĭnārĕ*, to try, to try by weight: It. *esaminare*]: to inspect carefully with a view to discover the real state of; to search or inquire into; to try by experiment, rule, or law; to scrutinize; to test the qualifications of by questions. Exam'ining, imp. Exam'ined, pp. *-ĭnd.* Exam'inable, a. *-ă-bl*, that may be inquired into. Exam'iner, n. one who. Exam'inator, n. *-tĕr*, one who. Exam ina'tion, n. *-ā'shŭn* [F.—L]: careful observation or inspection; investigation; scrutiny by study or experiment; research; test of knowledge by questions. Examen, n. *ĕgz-ā'mĕn* [L. that which examines, the tongue of a balance]: examination; the tongue on the beam of a balance, rising perpendicularly from it. Cross-examination, in *law*, the examination of a witness by the opposite party, with the view of shaking his evidence formerly given. Examination of a bankrupt: see Bankruptcy.—Examination of a prisoner, in *Scotland:* see Declaration.—Examination of a witness: see Evidence.—Examination for the public service: see Civil Service.—Syn. of 'examination': search; inquiry; scrutiny; inspection; exploration; exploitation; inquisition; discussion; debate.

EXAMPLE, n. *ĕgz-ăm'pl* [F. *exemple;* OF. *example*—from L. *exemplum*, a model or copy, a sample: It. *esemplo*]: a pattern, copy, or model; a specimen; one as an illustration of the whole; a former instance; that which, or the person who, is proper for imitation; one punished for the warning of others; an illustration of a rule or precept.—Syn.: instance; illustration; copy; case; sample; precedent; exemplification; warning; caution.

EXANGIA, n. *ĕks-ăn'jĭ-a* [Gr. *ex*, out; *anggeion*, a vessel for holding liquid, a vein]: in *pathol.*, a term applied to the excessive distension of a large blood-vessel.

EXANIMATE, a. *ĕgz-ăn'ĭ-māt* [L. *ex*, *anĭma*, life, spirit]: destitute of life; spiritless: V. to render destitute of life or animation; to dishearten. Exan'imating, imp. Exan'imated, pp.

EX ANIMO, phrase, *ĕks ăn'ĭ-mō* [L.]: from the soul.

EXANNULATE, a. *ĕks-ăn'nū-lāt* [L. *ex;* Eng. *annulate*]: in *bot.*, not having an annulus or ring around the spore-cases. Used of certain ferns. Of the three orders of Filicales, two, *Ophioglossaceæ* and *Danæaceæ*, are ringless, and one, *Polypodiaceæ*, is ringed.

EXANTHALOSE, n. *ĕks-ăn'tha-lōs* [Gr. *exantheō*, I put out flowers; *hals*, salt]: white efflorescence such as results from the exposure of Glauber's salt. Composition: sulphuric acid 42·5 to 44·8; soda 33·4 to 35; water 18·8 to 20·2. Found in Vesuvian lavas and at Hildesheim.

EXANTHEMA, n. *ĕks'ăn-thē'mă* [Gr. *exanthēmă*, a blossom, an eruption—from *ex*, out of; *anthos*, a flower]: in *med.*, an eruption—one of a class of contagious febrile diseases (see Fever) attended by distinctive eruptions on the skin, appearing at a definite period, and running a recognizable course. To this class belong small-pox, chicken-pox, measles, scarlet fever, and according to some authorities, plague, typhus, erysipelas, etc. Ex'anthe'mata, n. plu. *-thē'mă-tă*. Ex'anthe'matous, a. *-thē'mă-tŭs*, pertaining to. Exanthematology, n. *ĕks-ăn-thē-ma-tŏl'o-jĭ* [Gr. *exanthēma; logos*, a discourse]: department of medical science which treats of exanthemata or eruptions. Exanthesis, n. *ĕks-ăn-thē'sĭs* [Gr. *exanthēsis*, efflorescence, eruption]: in *med.*, nearly the same as exanthema; but exanthesis refers chiefly to the process of breaking out, and exanthema to that which breaks out, the character of the eruption after it has been formed.

EXANTLATE, v. *ĕks-ănt'lāt* [L. *exantlatus*, pp. of *exantlo*, I draw out, I suffer; Gr. *exantleō*]: to draw out; to exhaust, to wear out; to waste away.

EXARCH, n. *ĕks'ârk* [Gr. *exar'chŏs:* L. *exar'chŭs:* F. *exarque*—from Gr. *archē*, source, authority]: a viceroy; applied specially to viceroys under the Eastern emperors; an official in Greek churches. Exar'chate, n. *-âr'kāt*, dignity of an exarch; department governed by him.—*Exarch* was the title conferred first by Justinian on his commander-in-chief and vicegerent in Italy. The conquest of Italy by the Goths in the early part of the 6th c. was a severe blow to the Byzantine pride; and Justinian determined to wipe out the disgrace, and recover the imperial territories. The execution of this project was intrusted first to Belisarius (q.v.), afterward to Narses (q.v.), by whom the reconquest of Italy was effected. The latter was the first who bore the title of exarch; and the district over which he ruled was called the *Exarchate.* The seat of the exarch was Ravenna, the different towns and territories belonging to them being governed by subordinate rulers, styled *Duces* or Dukes. The extent of the exarchate, however, was gradually diminished, until it embraced only the country about Ravenna, the present Romagna, and the coasts of Rimini as far as Ancona. This was brought about partly by the conquest of the Longobards, partly by the dukes of Venice and Naples making themselves independent. In 728, even this small portion fell, for a short time, into the hands of the Longobards. In 752, Astulf, or Astolphus, King of the Longobards, put an end to the Byzantine rule at Ravenna; but in 755, he was compelled to resign the exarchate to Pepin the Less, King of the Franks, who gave it over to the Bp. of Rome, Stephanus II.—In the Christian Church, exarch was orignally a title of the bishops, afterward of a bishop who presided over several others—a primate. It was borne by the bishops of Alexandria, Antioch, Ephesus, Cæsarea, and Constantinople, till it was finally exchanged for the title of Patriarch. A superior over several monasteries was also called in ancient times an exarch. The same title is borne, in the modern Greek Church, by the person who 'visits' officially, as a sort of legate of the patriarch, the clergy and churches in a province.

EXAREOLATE, a. *ĕks-ăr-ē'o-lāt* [L. *ex, areola,* a small open place]: in *bot.*, not spaced out.

EXARILLATE, a. *ĕks-a-rĭl'lāt* [L *ex;* Eng. *arillate*]: in *bot.*, not having an aril.

EXARISTATE, a. *ĕks-a-rĭs'tāt* [L. *ex; aristatus,* having awns]: in *bot.*, not having an arista, an awn, or a beard.

EXASPERATE, v. *ĕgz-ăs'pėr āt* [L. *exăspĕrātus,* roughened, stirred up—from *ex,* out of; *asper,* rough: It. *esasperare:* F. *exaspérer*]: to irritate to a high degree; to excite to great anger; to enrage or provoke greatly: Adj. in *bot.*, clothed with hard, stiff, short points Exas'perating, imp. Exas'perated, pp. Exas'pera'tion, n. *-ā'shŭn* [F.—L]: the act of exciting to violent anger; an extreme degree of anger. Exasperater, n. *-tėr,* one who exasperates, irritates, or provokes.—Syn. of 'exasperate': to aggravate; irritate; provoke; enrage; incite; inflame; imbitter.

EXCÆCARIA, n. *ĕks-sē-kăr'ĭ-a* [L. *excæco,* I make blind, which the juice of the plant is said to do, while even the smoke is deleterious to the eyes]: in *bot.*, genus of *Euphorbiaceæ,* tribe *Hippomaneæ. Excaecaria Agallocha* received its specific name from the erroneous belief that it produced the agalloch or aloes wood.

EXCAMB, n. *ĕks'kăm* [mid. L *excambĭārĕ,* to exchange]: in *Scots law,* an exchange of one piece of land for another; also Excam'bion, n. *-bĭ-ŏn,* and Excam'bium, n. *-bĭ-ŭm.* Excamb', v., and Excam'bie, v. *-kăm'bĭ,* to exchange one piece of land for another. See ***Bell's Law Dictionary.***

EXCARNATE, v. *ěks kâr'nāt* [mid. L. *excarnātus*, stripped of flesh—from L. *ex*, out of; *carnem*, flesh]: to deprive or clear of flesh. EXCAR'NATING, imp. EXCAR'NATED, pp. EXCAR'NIFICA'TION, n. *-nĭ-fĭ-kā-shŭn* [L. *faciō*, I make]: the act of depriving of flesh.

EX CATHEDRA, a. or ad. *ěks' kă-thē'dră* [L. *ex*, from; *cathĕd'ra;* Gr. *kathĕd'ră*, a chair]: with authority or dogmatism, in allusion to a professor or teacher; with an air of official authority.

EXCAVATE, v. *ěks'kă-vāt* [L. *excăvātus*, hollowed out—from *ex*, out of; *căvus*, hollow]: to scoop or dig out; to hollow. EX'CAVATING, imp. EX'CAVATED, pp. EX'CAVATER, n. *-vā-tėr*, one who; a machine for cutting into rocks. EX'CAVA'TION, n. *-shŭn* [F.—L.]: a hollow cavity or pit formed by digging out earth; the act of digging out earth.

EXCEED, v. *ěk-sēd'* [F. *excéder*—from L. *excēdĕrĕ*, to go out, to withdraw—from *ex*, out of; *cēdō*, I go: It. *eccedere*]: to pass or go beyond; to excel; to surpass; to go too far; to go beyond any given limit. EXCEED'ING, imp.: ADJ. great in extent or duration; very large: AD. in a very great degree. EXCEED'ED, pp. EXCEED'INGLY, ad. *-lĭ*, very; unusually, to a very great degree.

EXCEL, v. *ěk-sĕl'* [F. *exceller*—from L. *excel'lĕrĕ*, to be high, to be eminent—from L. *ex*, *cello*, I impel or urge on: It. *eccellere*]: to surpass; to possess good qualities in a great degree; to do anything in a superior manner. EXCEL'LING, imp. EXCELLED', pp. *-sĕld'*. EX'CELLENCE, n. *-lĕns*, state of excelling; any valuable quality; also EX'CELLENCY, n. *-sĭ*. EX'CELLENCY, n. *-lĕn-sĭ*, a title of honor now given to viceroys, also to ambassadors, as representing not the affairs alone, but the persons of sovereign princes, to whom it was formerly applied. The privilege of being addressed as ‘Your Excellence,’ and of demanding a private interview with the prince to whom he is accredited, are the chief distinctions between the privileges of an ambassador, and an envoy or minister plenipotentiary: see AMBASSADOR: EMBASSY. EX'CELLENT, a. *-lĕnt*, of great virtue, worth, or quality; highly useful; prime; select; highly desirable. EX'CELLENTLY, ad. *-lĭ*.—SYN. of ‘excellence’: superiority; worth; perfection; goodness; greatness; purity; eminence;—of ‘excellent’: worthy; valuable; choice; exquisite; distinguished; admirable; superior; excessive.

EXCELSIOR, a. *ěk sĕl'sĭ-ŏr* [L. *excelsus*, lofty; *excelsiŏr*, loftier]: more lofty; more elevated; higher still. EXCEL'SITUDE, n. *-tūd* [L. *excelsus*, high, lofty]: height.

EXCENTRIC, n. *ěk-sĕn'trĭk* [see ECCENTRIC]: a wheel having the axis removed from the centre: ADJ. deviating from the centre; removed from the centre or axis. EXCENTRAL, a. *ěks-sĕn'tral*, in *bot.*, out of the centre. EXCENTRICAL, a.: same as ECCENTRIC. EXCENTRICITY: same as ECCENTRICITY.

EXCENTROSTOMATA, n. *ěk-sĕn-tro-stōm'a-ta* [Gr. *ekkentros*, out of the centre; *stoma*, mouth]: in *zool.*, name given by De Blainville to a family of *Echinida*, with a more or less elongate, cordate body. Chief genera, *Spatangus* (recent), and *Annachites* (fossil).

EXCEPT, v. *ĕk-sĕpt'* [OF. *excepter*—from L. *exceptārĕ*, intensive of *excipĕrĕ*, to withdraw—from *ex*, out of; *căpĭō*, I take: F. *exciper*]: to pass over; to take or leave out of any specified number; to object; to exclude. Excep'ting, imp.: Prep. without including; to the exclusion of. Excep'ted, pp: Adj. left out; specially excluded. Except, conj. unless; without: Prep. exclusive of; not including; save; but. Excep'tion, n. *-sĕp'shŭn* [F.—L.]: the act of excluding or leaving out of a certain number; that which is excluded or separated from others; the person or thing not included; an objection; dislike; slight offense taken; a saving clause in a formal writing. Excep'tionable, a. *-ă-bl*, liable to objection. Excep'tional, a. *-ăl*, forming an exception. Excep'tive, a. *-tĭv*, including an exception. Excep'tor, n. *-tėr*, one who. Exceptless, a. in *OE.*, usual; that has not an exception. Exception proves the rule, the very fact of exceptions shows there must be a rule.

EXCERNENT, a. *ĕk-sėr'nĕnt* [L. *ex*, out of; *cernen'tem*, separating, sifting]: in *med.*, connected with excretion.

EXCERPT, v. *ĕk-sėrpt'* [mid. L. *excerptum*, a picking, an extract—from *ex*, out of; *carpo*, I pluck or take]: to select parts of any writings: N. an extract or selection from a writing. Excerpta, n. *-a*, excerpts, extracts. Excerp'ting, imp. Excerp'ted, pp. Excerption, n. *ĕk-serp'shŭn*, an extract.

EXCESS, n. *ĕk-sĕs'* [OF. *excez*, superfluity, excess—from L. *excessus*, retiring, withdrawing—from *ex*, out of; *cessus*, gone, departed: comp. *ex*, out of; Eng. *cess*, rate, measure—*lit.*, out of all measure]: a passing or going beyond a certain measure or limit; more than enough; intemperance; difference between things unequal. Exces'sive, a. *-sĭv*, being in excess; beyond any given measure or limit; unreasonable; extreme. Exces'sively, ad. *-lĭ*, in a great degree; exceedingly. Exces'siveness, n. the state or quality of being excessive.—Syn. of 'excess': superfluity; redundance; super-abundance; immoderateness; dissipation; remainder.

EXCHANGE, v. *ĕks-chānj'* [F. *échanger;* OF. *eschanger*, to exchange, to barter—from L. *ex*, out of; F. *changer*, to change]: to give one thing for another; to barter; to resign or lay aside one state or condition and take another instead of it; to give and receive the like thing: N. the act of giving one thing or commodity for another; barter; the act of giving up one condition or state for another; a place where merchants meet, or the meeting itself—in this sense often written 'Change: a rule in arithmetic; the practice of merchants purchasing foreign bills of exchange in order to enable them to make remittances to foreign countries without actually forwarding cash—the course of exchange is the value or price of such remittances, varying according to the demand for the time being. EXCHAN′GING, imp. EXCHANGED′, pp. *-chānjd′*. EXCHAN′GER, n. one who deals in money in the way of giving the money of one country for that of another. EXCHANGE′ABLE, a. *-ă bl*, fit or proper to be exchanged; that may be exchanged. EXCHANGE′ABIL′ITY, n. *-bĭl ĭ-tĭ*, the state or quality of being exchangeable. BILL OF EXCHANGE, a written order or promise to pay money for value received—issued in the country where payable it is called an *inland bill*, if payable in another country it is called a *foreign bill* (see below).—SYN. of 'exchange, v.': to traffic; truck; commute; bargain; interchange; deal; trade.

EXCHANGE′: building or place of resort for merchants. The name Bourse (Purse) is applied in France and Belgium to a resort of this kind; and in Berlin, Hamburg, and other German cities, there is the equivalent word Börse. Exchanges have usually comprehended an open quadrangle, surrounded by an arcade free to all persons; but in some cases large reading-rooms or halls now constitute resorts of this kind, and these are open only to a body of subscribers, and visitors whom they introduce.

Exchanges originated in the commercial cities of Italy, Germany, and the Netherlands, from which last-named country they were copied by England. The merit of introducing them is due to Sir Thomas Gresham, who, having resided as British agent at Antwerp 1550, chose the Bourse of that city as a model for the Royal Exchange of London. Their institution in England is therefore coincident with the rise of commercial prosperity in the middle of the 16th c. The first stone of Gresham's Burse, for so it was originally called, was laid 1566, June 6, a site being found for it by removing eighty houses in Cornhill, and it was finished 1567, Nov. It consisted of a quadrangle with an arcade; above was a corridor with stalls, for the sale of wares. This corridor was called the *pawn*—believed to be a corruption of *bahn*—Ger. for path or walk. Outside were shops. The Burse was ceremoniously opened by Queen Elizabeth immediately after dining at the house of Sir Thomas Gresham in Bishopsgate Street, 1570 (–71), Jan. 23. Having viewed the whole Burse, the queen, by herald and trumpet, caused it to be proclaimed 'The Royal Exchange.' This first Exchange of London was almost entirely destroyed by the great fire of 1666. A new Exchange, forthwith erected on the spot, was opened 1669; this also was destroyed by fire, 1838. The foundation-stone of the third Exchange was laid by Prince Albert, 1842; and it was opened 1845, by Queen Victoria.

The term Exchange seems to have been naturally adopted from the circumstance that buying and exchanging of merchandise, and also exchanging and paying away of money, formed the chief object of concourse. In the present day, early intelligence in matters affecting commerce and public finance forms a principal attraction of this kind of resort. Although open daily, there are usually certain days and hours of meeting when the throng is considerable. The meeting is familiarly called 'Change.' The two great days of meeting at the Royal Exchange, London, are Tuesdays and Fridays, and the busiest time is from 3 to 4 o'clock. In London there are several other Exchanges, for special purposes; among these are the Corn Exchange in Mark Lane, the Coal Exchange in Lower Thames Street, the Hop and Malt Exchange in Southwark, the Hide and Skin Exchange or Market in Bermondsey, and the Stock Exchange near the Bank of England. Exeter Change, which was a sort of bazaar, with a menagerie of wild beasts, stood in the Strand, upon or near the site of the house of the Earl of Exeter; the building, as an interruption to the thoroughfare, was removed 1829. Numerous additions have recently been made to the list of exchanges in the large towns of England and Scotland. The Bourse at Paris, and the Produce Exchange at New York, are noteworthy for architectural elegance. The new Stock Exchange in New York (1903) is the most notable of all.

EXCHANGE, in Political Economy: sometimes the conversion of the money of one country into its equivalent in the money of another—as by stating the relation which French francs or British pounds bear to U. S. dollars. The technical meaning of the word has now, however, come to be the difference between the actual value of money, taken by the standard of bullion, in any two places with relation to each other. If, in New York, it costs more than $100 to pay $100 in St. Petersburg, the rate of exchange is against New York, and in favor of St. Petersburg, an inhabitant of which will be able to pay a debt of $100 in New York with less than $100 worth of bullion in St. Petersburg. The process will be best explained by analyzing it through means of simple examples. If Thomson & Co. of New York buy $100 worth of paper from De la Rue of Paris, and De la Rue, on the other hand, buy $100 worth of cotton goods from Thomson & Co. of New York, the two debts, *were there no others between the merchants of the same towns,* would extinguish each other, and there would be no necessity either for transmitting money or drawing bills of exchange. Suppose, however, that it is not De la Rue, but his neighbor Bonchamp who has bought the $100 worth of cotton goods from Thomson & Co., then the debts of all will be settled by Bonchamp paying $100 to De la Rue on Thomson & Co.'s account. Suppose, next, the case of De la Rue owing nothing to Thomson & Co., and Bonchamp owing them only $50, a like sum has to be otherwise found. Van Pradt of Amsterdam is owing precisely this sum to Thomson & Co., while either De la Rue or Bonchamp is owing the same amount to Van Pradt for a purchase of Gouda cheeses; then it is clear that the several debts can be adjusted among them without the transmission of bullion. It will cost some trouble to adjust the payments, however, and this trouble will have to be paid for. As in paying Thomson & Co. their debt of $100, De la Rue will have to pay for this trouble, the rate of exchange will be against him. If the debt, or any part of it, cannot be met by such an adjustment out of cross debts and credits, it will be necessary for the debtor to send bullion to his creditor; and this being an expensive process, it throws the rate of exchange against the debtor who so pays. For instance, if the sum due by the Frenchmen to Van Pradt was only $25 instead of $50, then De la Rue would have had to be at the expense of sending $25 to New York in bullion. No such actual transactions take place in the mercantile world, because the accounts in debtor and creditor connected with the three towns above referred to are to be counted in thousands, and ramify into other towns; but the above examples may represent the groups of debtors and creditors, as algebraic signs represent quantities. The individual merchants in one trading town have no idea how the surplus of debit or credit may lie between them, far less can they tell how it may be adjusted by debits and credits in other towns; but through the agency of bankers, bill-discounters, and other persons who deal in money, the relations of all trading-places toward each other are in a constant state of shifting and adjustment; and any one who has to pay a debt in any trading-place can find out how much he has to give to get that payment made, and can pay it accordingly. When, through the operation of these complicated transactions, you require to give more than $100 in New York to get that amount paid in Paris, then the rate of exchange is against New York, and is in favor of Paris, where less than $100 in cash will pay a debt of $100 in New York. The difference will generally depend on the difficulty of adjusting questions of debt and credit throughout the field of commerce, in such a manner as to procure payment of the debt. If it cannot be paid by adjustment, then bullion must be sent; and thus it is generally said, that the rate of exchange against any place is limited by the charge of transmitting bullion to it. The rate of exchange is liable to be brought to a level also by commercial exportation and importation, since, whenever it is expensive to get money sent to a country, there is a temptation to send goods to that country, to compensate the debt. In the general circle of transactions of this kind, the country or town which has the largest amount of transactions will have the largest number of debtors and of creditors, and will thus afford the chief facility for each compensating the other. It is thus that London is the centre of the money-market, where all the debts and credits in the world may be said to meet and extinguish each other. Formerly, extreme notions about the Balance of Trade (q.v.) led to the theory that any nation which the exchange was against was going to ruin; while that which the balance was in favor of was prospering through the other's loss. At present it is inconvenient and expensive to a country to have the exchange against it. An adverse exchange generally indicates a sort of break in the circle of trade, which it would be advantageous to fill up, and *may* be caused by the commerce of a country decreasing; on the other hand, however, the imports for which a country pays in cash or in expensive bills, may be the same as a highly advantageous traffic. Gold-producing countries find bullion their most advantageous export, as do countries into which gold has flowed in excess. See BILL OF EXCHANGE.

EXCHA'NGE, DEED OF: under the English common law, a mode of conveying equal interests in lands, the one in consideration of the other. In the United States, the common-law deed of exchange has become obsolete, and lands may be exchanged by the ordinary deed of bargain and sale. The words 'excambium' and 'excambion' (see EXCAMB) were synonymous with exchange, in the technical sense above referred to.

EXCHANGES, MILITARY: certain arrangements made between officers of the English army. An officer may exchange, or change places, in the Guards, or Line, with another of equal rank in any regiment of the above corps, by mutual consent, and subject to the approval of the minister of war, and on payment of a sum agreed upon between the officers.

EXCHEAT, v. *ĕks-chēt'* [*ex, cheat*]: in *OE.*, same as escheat: N. in *OE.*, a fraudulent exchange.

EXCHEQUER, n. *ĕks-chĕk'ĕr* [F. *échiquier;* OF. *eschequier*, a chessboard, checker-work—said to have been so called from the large-patterned checked cloth which covered the table of the Exchequer]: a treasury; in *familiar language*, cash or funds in hand; in *Britain*, a court of law having exclusive jurisdiction in all cases affecting the public revenue; one of the divisions of the high court of justice: V. to institute proceedings in the court of exchequer. EXCHE'QUERING, imp. EXCHE'QUERED, pp. *-ĕrd.* EXCHEQUER TALLIES, rude device in use till 1783 in the English Exchequer, for checking accounts. They were seasoned wands of ash, hazel, etc., duly inscribed and notched, then split, and one-half given to the payer. When he presented his half, if it were found to match the half retained, the proper payment was made to him.

EXCHEQ'UER, CHANCELLOR OF THE: in Britain, in modern times, the first finance minister of the crown. Strictly speaking, he is the under-treasurer, the office of lord high treasurer being now vested in the lords commissioners of the treasury. When the prime minister is a member of the house of commons, he sometimes holds the office of chancellor of the exchequer. The judicial functions of the chancellor of the exchequer may now (since 1735) be considered matter only of history. See EXCHEQUER, COURT OF.

EXCHEQ'UER, COURT OF: now merged in the high court of justice in England: formerly the court wherein all matters relating to the royal revenues were adjudicated. It is said (Madox, *Hist. of Ex.* i. 177) that as early as the reign of William the Conqueror a court of exchequer was in existence. This was probably nothing more than a branch of the *Aula Regia*, or great council of the nation; but on the subdivision of that court in the reign of Edward I., the court of exchequer acquired a separate and independent position. The special duty then assigned to the court was to order the revenues of the crown, and recover the king's debts and duties. The court was then denominated the *Scaccarium* (from *scaccus* or *scaccum*, a chessboard), because a checkered cloth was anciently wont to be laid upon the table of the court (Madox, *Hist. of Ex.*). The court formerly consisted of two divisions, an equity, and a common law or plea side. Lord Coke (*Inst.* iv. 118) appears to doubt whether the equitable jurisdiction of the court can be traced back further than the statute 33 Henry VIII. c. 39. This equitable jurisdiction of the exchequer was abolished by 5 Vict. c. 5, and transferred to the court of chancery. On the first institution of the court of exchequer the business was confined chiefly to matters connected with the royal revenue, but a privilege was conceded to all the king's debtors and farmers, and all accountants of the exchequer, to sue and implead all manner of persons. Gradually the court of exchequer acquired a concurrent jurisdiction with the other courts of common law. The judges of the exchequer consisted originally of the lord treasurer, the chancellor of the exchequer, and three puisné judges, called barons of the exchequer. From 1873 to 81 the court constituted a division of the high court of justice, having a chief baron and four barons of exchequer. But by the Supreme Court of Judicature Act (1881), the power formerly exercised by the chief baron of exchequer, was transferred to the lord chief-justice of England.

The Court of *Exchequer Chamber*, established by 31 Edw. I. c. 12, was formerly a court of all the judges in England assembled for decision of matters of law (Coke, *Inst.* iv. 110, 119). Its ordinary jurisdiction was as a court of error, in which capacity it revised the judgments of the three courts of common law. Since 1873, appeal lies from each division of the high court of justice in England, direct to the court of appeal, which succeeded to the jurisdiction formerly vested in the house of lords, as the supreme court of appeal, and consists of the lord chancellor, and the chiefs of the divisions, and the judges of the privy council.

In Scotland, before the Union, the exchequer was the king's revenue court. By 19 and 20 Vict. c. 56, the court of exchequer is abolished, and the jurisdiction transferred entirely to the court of session.

The Court of *Exchequer Chamber* in Ireland, established by 40 Geo. III. c. 39, was abolished as an intermediate court of appeal between the Irish courts and the high court in England.

EXCHEQUER BILLS, in England: bills issued at the Exchequer under the authority of acts of parliament, as security for money advanced to the government. They contain an engagement on the part of the government for the payment of the principal sums advanced with interest. These bills form the chief part of the unfunded debt of the country. They were issued first in the reign of William III., 1696, and were drawn for various amounts from £100 to £5. At that time they bore interest at the rate of threepence per day on a hundred pounds (Macaulay, *History of England*, iv. 700) the interest was reduced to 2*d.* during the reign of Anne. During the war 1793–1814, the rate of interest was usually 3½*d.* At present, it is generally from 1½*d.*

to 2½*d.* per £100 per diem. Holders of these bills are exempt from all risk, except that arising from the amount of premium or discount they may have given for them. The bills, varying in amount from £100 to £1,000, pass from hand to hand as money, and are payable at the Treasury at par. They may be paid also to government in discharge for taxes. When it is intended to pay off outstanding Exchequer bills, public notice is given by advertisement. The advances of money to the government by the Bank of England are made on Exchequer bills. These bills are a convenient means whereby the government can meet a sudden demand for unusual expenditure. The amount of Exchequer bills in 1880-1 was £5,162,800. Another portion of the unfunded debt is constituted by Exchequer Bonds, with fixed rates of interest for definite periods. In 1881 their value was £11,483,700. Between 1874 and 81 the total unfunded debt (including Treasury Bills, Exchequer Bills, and Exchequer Bonds) rose from £4,479,600 to £22,077,500.

EXCIPIENT [Lat. *excipio,* I receive]: inert or slightly active substance, introduced into a medical prescription as a *vehicle,* or medium of administration for the stricly medicinal ingredients. Thus, conserve of red roses, or bread-crumb, is used to make up pills; sulphate of potass, or white sugar, in medicinal powders; water, mucilage, white of egg, and many other substances in fluid mixtures.

EXCIPULUS, n. *ĕk-sĭp'ū-lŭs,* or EXCIP'ULA, and EXCIPLE, n. *ĕk-sĭp'l* [L. *excĭpŭlă,* receivers, receptacles—from *excĭpĭō,* I catch, alluding to the roughness of the surface]: in *bot.,* a receptacle containing fructification in lichens; a minute species of black fungus found in autumn upon dead raspberry-stems.

EXCISE, n. *ĕk-sīz'* [L. *excīsus*, cut out or off—from *ex*, out off; *cædo*, I cut: F. *excise*, tax on merchandise—*lit.*, a piece or part cut out or off]: a tax or duty levied on articles produced and consumed in a country, as on spirits, malt, etc.; a tax levied on licenses to pursue certain trades, and deal in certain commodities: Adj. pertaining to the duties levied on certain articles produced and consumed at home V. to levy a tax on. Excising, imp. Excised, pp. *-sīzd'*. Excis'able, a. *-sīz'ă-bl*, liable to be taxed. Excise'man, n., or Excise-officer, n. one who inspects and rates articles liable to excise duty. *Note.*—In the sense of 'a duty or tax on native commodities, etc.,' *excise* is clearly a corruption and an accommodation in popular etymology of sound to sense: the OF. *assise* was the assize or sessions at which commodities were assessed, and finally the taxes so imposed. From a similar source the Belgium *accüse* is tribute: comp. Sp. *sisa*, assize, excise; old Dut. *aksüs;* Ger. *accise*, excise: see Assize.—*Excise* is not, according to its name, a part of the value of a commodity taken out and given to the public revenue; for the manufacturer who looks to a profit on his outlay merely counts the tax as part of his expenditure, which he intends to get back with a profit, so that it constitutes an addition to the ultimate price which the purchaser or consumer has to pay. A tax on commodities sold and bought is a very obvious one, but it has generally appeared in the simple shape of a toll on goods brought to market; and the complicated arrangements for officially watching the process of a manufacture for the purpose of seeing that none of the dues of the revenue are evaded, is of comparatively modern origin. It was introduced into England by the Long Parliament, who established an excise on liquors 1643. Though always unpopular, the excise in some form or other has ever since continued as a material element in the taxation and revenue of Britain. In the earlier part of last century Sir Robert Walpole entertained the notion of enlarging its productiveness while mitigating its proportional pressure, by the bonding system, which suspends the exaction of the duty until the goods are sold, and thus leaves the manufacturer all his capital to be devoted to production: see Warehousing System. But the rumor of an enlargement of the unpopular excise duty created a general excitement, and the memorable cry of 'Liberty, Property, and no Excise,' compelled Walpole to abandon his project.

An excise, compared with other taxes, has its good and its bad features: it is a method of extracting money for national purposes from personal expenditure on luxuries, and is especially serviceable when fed from those luxuries the use of which in excess becomes a vice. On the other hand, it renders necessary a system of inquisitorial inspection not only very offensive to all free people, but very open to abuse and fraud; while at the same time excessively high duties, and duties on commodities strictly of domestic manufacture, lead to smuggling and all its demoralizing consequences. The evils of an excise were formerly aggravated by the practice of farming the duties—that is, by letting them to the highest bidder, whose interest it became, like any other contractor, to make the greatest possible profit by his speculation, and consequently to exact the duties in the most rigorous manner. In every well-regulated revenue system, it is of course only fair to all parties that the duty as the law lays it on should be fully exacted; but in the age of farming, the arrangements were all slovenly, and there was much latitude of power in the hands of the farmers. The farming system became very oppressive in France, especially in the *gabelle* or excise on that necessary of life, salt. It is a curious fact, however, that when the farming of the excise was abolished in Scotland by the Union, the people grumbled, saying they were easier under the farmers, their own neighbors, who acted on the principle of 'live and let live,' than under the officers sent from England, who rigidly collected the impost.

An excise works most easily when it is laid on some commodity not of domestic production, but created by manufacturers on a large scale. In a great distillery, the excise officer is almost a portion of the establishment, who has an eye on every step of the process, with the view of seeing that the commodity does not go into the market without government obtaining its proper share—sometimes far the greater part—of the market price. The social influence of such an arrangement is very different from that of the old candle and salt duties, which made it the function of the exciseman to pounce on a farmer's family melting the surplus tallow of the last killed sheep, or of a fisherman boiling sea-water to procure salt for his potatoes. The manufacturer, however, though he has the benefit of the bonding system, feels the excise regulations as a perpetual drag and hinderance in his operations, since there are multitudes of minute operations which he cannot perform without sending special notice to the excise department, or having an officer actually present. This renders it necessary, too, that all the steps of the process should not merely be defined as between the manufacturer and the officer, but should be set forth in an act of parliament; and hence deviations for the purpose of economy, or by way of experiment, become difficult, and sometimes impracticable. As difficulties with which the producer has to contend, these things require him to lay on the selling price of the commodity a larger addition, by reason of the excise, than the actual amount of the duty.

No method of taxation requires a nicer adjustment to the social condition of a country than an excise. Thus, in England, in 1746, a duty of 20*s.* a gallon was laid on spirits, with the view of suppressing the vice of drunkenness, which, on the other hand, it greatly increased, for the law became a dead letter, and the smuggler fully supplied the market, though within the two years in which the law was in force, no fewer than 12,000 persons were, according to Tindal's History, convicted of offenses against the act. In Scotland, the duty, which was 5*s.* 6*d.* a gallon, had to be reduced in 1823 to 2*s.*, on account of the prevalence of smuggling—half the consumption of the country, in fact, paying no duty. The duty has since then been gradually raised, until it now amounts to 10*s.* a gallon, forming a vast source of revenue. The whole excise revenue of the United Kingdom for 1895-6 amounted to £26,800,000, of which £16,380,134 were derived from spirits, £11,130,854 from beer, and £1,574,570 from the licenses of publicans or retail liquor-dealers of all kinds. The productiveness of this great source of revenue, and the expense connected with the levying of a duty on other commodities, has led to the gradual removal of many excise duties, as, for instance, on salt, candles, leather, glass, soap, paper, and race-horses. The malt-tax was transferred to beer 1880. In 1849, the excise department was amalgamated with that of stamps and taxes to form the Board of Inland Revenue; and many changes have been made both as to the articles taxable, and on the organization of the excise system. The only articles on which excise duties are now charged are spirits, beer, chicory, and the passenger receipts of railway companies. But various taxes of the nature of license-duties for following particular pursuits are collected in the excise department; also several items chargeable before 1869 as assessed taxes. License-duties must be taken out yearly by auctioneers, appraisers, brewers, maltsters, distillers, makers of vinegar, victuallers, sellers of beer, spirits, and wine, sellers of playing cards if also makers, hawkers, horse-dealers, house-agents, tobacconists, pawnbrokers, dealers in sweets, and dealers in patent medicines. Game-licenses, gun-licenses, and licenses for male-servants, horses, dogs, carriages, and the use of armorial bearings, come under the same department. According to the present organization of the excise department, the United Kingdom is divided into collections, each under a collector; the collections are subdivided into districts, each under a supervisor; and these into divisions, each under divisions-officers and ride-officers. The efficiency with which these officials discharge their duties secures a very complete payment of taxes, and their manner of dealing with the tax-payers leaves a *minimum* of just ground for complaint.

In the United States, the word excise is little used except in reference to a tax on the sale of intoxicating liquor.—See INTERNAL REVENUE: TAX.

EXCISION, n. *ĕk-sĭzh'ŭn* [F. *excision*—from L. *excisĭōnem*, destruction: L. *excīsus*, cut out or off (see EXCISE)]: a cutting out or off; amputation; destruction.

EXCITE, v. *ĕk-sīt'* [F. *exciter*—from L. *excĭtārĕ*, to rouse up—from *ex*, out of; *cĭto*, I call or summon: It. *eccitare*]: to call into action; to rouse; to animate; to stimulate; to inflame; to raise or stir up. EXCI'TING, imp.: ADJ. calling or rousing into action; stimulating. EXCI'TED, pp.: ADJ. roused; awakened; animated. EXCI'TER, n. one who. EXCI'TABLE, a. *-sī-tă-bl* [F.—L.]: easily provoked or called into action. EXCI'TABIL'ITY, n. *-bĭl'ĭ-tĭ*, the being easily provoked or called into action. EXCITE'MENT, n. *-sīt'mĕnt*, state of being excited; agitation; that which excites. EX'CITANT, a. *-sĭ-tănt* [F.—L.]: that which produces or is capable of producing increased action; in *med.*, excitants are stimulants, pharmaceutical preparations which, acting through the nervous system, tend to increase the action of the heart and other organs. They all have more or less pungent and acrid taste, and give rise to a sensation of warmth when placed on a tender part of the skin. The class is very numerous; and the application should be under the supervision of a qualified medical practitioner. Exci′tative, a. *-sī′tă-tĭv*, having power to excite. Ex′cita′tion n. *-sĭ-tā′shŭn* [F.—L.]: the act of exciting. Exci′tatory a. *-tėr-ĭ*, tending to excite. Exci′tingly, ad. *-lĭ*. Excito motor action: see Nervous System. Exciting-causes, n. in *med.*, causes which tend immediately to produce disease, as distinguished from predisposing causes, which during long periods of time prepare the way for it to arise. Excito-motory, a. in *anat.*, the function of the nervous system by which an impression is transmitted to a centre and reflected so as to produce contraction of a muscle without sensation or volition.—Syn. of 'excite': to incite; awaken; arouse; irritate; provoke; kindle; stir up; agitate

EXCLAIM, v. *ĕks-klām'* [OF. *exclamer'*—from L. *ex clamārĕ*, to cry aloud—from *ex*, out of: *clāmō*, I cry: It *esclamare*]: to cry out loudly; to speak or utter emphatically; to make a loud outcry in words: N. in *OE.*, clamor; outcry. Exclaim'ing, imp Exclaimed', pp. *-klāmd'*. Exclaim'er, n. one who. Ex'clama'tion, n. *-klă-mā'shŭn* [F.—L.]: outcry; a loud noise in words; vehement utterance; the point or mark (!) put after the words expressing emphatic speech. Exclam'ative, a. *-klăm'ă-tĭv*, containing exclamation. Exclam'atory, a. *-tėr-ĭ*, expressing exclamation.—Syn. of 'exclamation': clamor; cry; uproar; acclamation; tumult; bawling; shouting; vociferation; utterance.

EXCLAVE, n. *ĕks'klāv* [L. *ex*, out; *clavis*, key]: portion of a country separated from the main part.

EXCLUDE, v. *ĕks-klôd'* [L. *exclūdĕrĕ*, to shut out, to exclude—from *ex*, out of; *claudo*, I shut: It. *escludere:* F. *exclure*]: to hinder from entering; to shut out; to debar; to prohibit; to except. Exclu'ding, imp. Exclu'ded, pp. Exclu'sion, n. *-klô'zhŭn* [F. *exclusion*—from L. *exclūsiōnĕm*—from *clausus*, closed, shut]: the act of shutting out; the act of debarring; rejection; exception. Exclu'sionary, a. *-er-ĭ*, tending to exclude or debar. Exclu'sionist, n. one who would debar another from any right or privilege. Exclu'sive, a. *-klô'sĭv*, tending to exclude; having the power to exclude; not admitting to social intercourse; illiberal; not taking into the account; not including. An exclusive, one whose real or affected fastidiousness makes his circle of acquaintance more than ordinarily select. Exclu'sively, ad. *-lĭ*. Exclu'siveness, n.—Syn. of 'exclude': to forbid; deprive; hinder; disqualify; preclude; thrust out; eject.

EXCLU'SION BILL: proposed measure for excluding the Duke of York, afterward James II., from the succession to the English throne, on account of his avowed Rom. Catholicism. A bill to this effect passed the commons 1679, but was thrown out by the upper house. As the new parliament summoned 1681 seemed determined to revert to this measure, it was dissolved, and Charles ruled henceforth without control. See Charles II: James II.

EXCOGITATE, v. *ĕks-kŏj'ĭ-tāt* [L. *excōgĭtātus*, found out by thinking, devised—from *ex*, out of; *cōgĭtō*, I think]: to invent or contrive; to strike out by thinking. Excog'itating, imp. Excog'itated, pp. Excog'ita'tion, n. *-tā'shŭn*, invention or contrivance by thinking.

EXCOMMUNICATE, v. *ĕks'kŏm-mū'nĭ-kāt* [L. *excommunĭcātus*, put out of a community—from *ex*, out of; *commūnĭcātus*, having anything in common with one: It. *communicare;* F. *communiquer*, to impart]: to expel or exclude from the communion of the church; to deprive of church privileges: N. one who is excluded from the fellowship of the church: Adj. excluded from church privileges. Ex'commu'nicating, imp. Ex'commu'nicated, pp.: Adj. expelled or separated from communion with a church. Ex'communica'tion, n. *-kā'shŭn* [F.—L.]: act of expelling from the communion of a church; deprivation of church privileges; withdrawal of Christian fellowship by a church The ancient Romans had something analogous in the exclusion of persons from the temples and from participation of the sacrifices, which persons were also given over with awful ceremonies to the Furies. The Mosaic Law decreed excommunication in case of certain offenses; and the intimate connection of things civil and ecclesiastical under the Jewish polity, rendered it terrible even as a temporal punishment. The Jews, in practice, had three degrees of excommunication. The first, *Niddui,* was an exclusion from the synagogue for 30 days, that the offender might be ashamed. The second, *Cherem,* also was for 30 days, but beside exclusion from the synagogue, carried with it a prohibition to all other Jews of any intercourse with the individual, and was often proclaimed with sound of trumpet. The third, *Shammatha* or *Anathema Maranatha* (see I. Cor. xvi. 22), was exclusion from the synagogue and privileges of the Jewish Church for life, with loss of civil rights, and was accompanied with terrible curses, in which the offender was given over to the judgment of God. In the Christian Church, excommunication has in all ages been practiced, as indeed every society must necessarily have the power of excluding unworthy members and those who refuse to comply with its rules, and the New Testament plainly recognises and establishes this right in the church. But two different degrees of excommunication were soon distinguished—the first or lesser, a mere exclusion from the Lord's Table and from other privileges of members of the church; the second or greater, pronounced on obstinate offenders and persons who departed into deadly errors of doctrine, more solemn and awful, and not so easily capable of being revoked. Penances and public professions of repentance were required; and in Africa and Spain, the absolution of *lapsed* persons (i. e., those who in time of persecution had yielded to the force of temptation, and fallen away from their Christian profession by the crime of actual sacrifice to idols) was forbidden, except at the hour of death, or in cases where martyrs interceded for them. But for a long time, no civil consequences were connected with excommunication. Afterward, the greater excommunication was accompanied with loss of political rights, and exclusion from public offices. The power of excommunication also, which had been at first in the church as a body, gradually passed into the hands of the bishops, and especially of the popes, who did not scruple to exercise it against entire communities at once. The *capitularies* of Pepin the Less, in the 8th c., ordained that the greater excommunication should be followed by banishment from the country. The Roman Cath. Church pronounces the sentence of excommunication with many circumstances of terrible solemnity, and it contains a prohibition to all Christian persons of all intercourse with the person excommunicated, and of extending to him even the most ordinary social offices. The latest 'examples' made by the pope were Napoleon I. 1809, and Victor Emmanuel, King of Italy, 1860; neither of whom. however, was excommunicated by name, the pope having confined himself to a solemn and reiterated publication of the penalties decreed by his predecessors against those who unjustly invaded the territories of the Holy See, usurped or violated its rights, or violently impeded their free exercise. Pope Innocent III., in the Lateran Council (1215), declared that excommunication put an end to all civil rights and dignities, and to the possession of any property. The excommunication of a sovereign was regarded as freeing subjects from their allegiance, and in 1102, this sentence was pronounced against Emperor Henry IV., an example which subsequent popes ventured to follow. But the fearful weapons with which the popes armed themselves in this power of excommunition, were rendered much less effective through their incautious employment, the evident worldly motives by which it was sometimes governed, and the excommunications which rival popes hurled against each other during the time of the great papal schism. The Greek Church also makes use of excommunication, and every year at Constantinople, on a certain Sunday, the greater ban is pronounced against the Rom. Cath. Church.—The Reformers retained only that power of excommunication which appeared to them inherent in the constitution of the Christian society, and to be sanctioned by the New Testament; nor have any civil consequences been generally connected with it in Prot. countries. To connect such consequences with excommunication in any measure whatever, is certainly inconsistent with the principles of the Reformation Nevertheless, in England, until the 53d of Geo. III. c. 127, and in Ireland, until the 54th, c. 68, persons excommunicated were debarred from bringing or maintaining actions, from serving as jurymen, from appearing as witnesses in any cause, and from practicing as attorneys in any of the courts of the realm. All these disabilities were removed by the statutes above named; and the excommunicated were declared no longer liable to any penalty, except 'such imprisonment, not exceeding six months, as the court pronouncing or declaring such person excommunicate shall direct.

In the Rom. Cath. Church, the power of excommunicating is held to reside, not in the congregation, but in the bishop; and this is believed to be in exact accordance with the remarkable proceeding commemorated 1 Cor. v. 3–5, and with all the earliest recorded examples of its exercise. Like all the other powers of the episcopate, it is held to belong, in an especial and eminent degree, to the Roman bishop, as primate of the church; but it is not thought to belong to him exclusively, nor has such exclusive right ever been claimed by the bishops of Rome. On the contrary, bishops within their sees, archbishops while exercising visitatorial jurisdiction, heads of religious orders within their own communities, all possess the power to issue excommunication, not only by the ancient law of the church, but also by the most modern discipline. As to the prohibition of intercourse with the excommunicated, a wide distinction is made between those who are called 'tolerated' and those who are 'not tolerated.' Only in the case of the latter (a case extremely rare, and confined to heresiarchs, and other signal offenders against the faith or public order of the church) is the ancient and scriptural prohibition of intercourse enforced. With the 'tolerated,' since the celebrated decree of Pope Martin V. in the Council of Constance, the faithful are permitted to maintain the ordinary intercourse. It is a mistake, likewise, to ascribe to Rom. Catholics the doctrine, 'that excommunication may be pronounced against the dead.' The contrary is expressly laid down by all canonists (Liguori, *Theologia Moralis*, lib. vii. n. 13, 1). In the cases in which this is said to have been done, the supposed 'excommunication of the dead' was merely a declaration that the deceased individual had, *while living*, been guilty of some crime to which *excommunication is attached by the church laws.* Rom. Cath. writers, moreover, explain that the civil effects of excommunication in the mediæval period—such as incapacity to exercise political rights, and even forfeiture of the allegiance of subjects—were annexed thereunto by the civil law itself, or at least by a common international understanding in that age. Examples are alleged in the law of Spain, as laid down in the Sixth Council of Toledo—a mixed civil and ecclesiastical congress—(638); in the law of France, as admitted by Charles le Chauve (859); in the Saxon and in the Swabian codes; and even in the English laws of Edward the Confessor; all which, and many similar laws, proceed on the great general principle of these mediæval monarchies, viz., that orthodoxy and communion with the Holy See were a necessary condition of the tenure of supreme civil power; just as by the 1 Will. and Mary, s. 2, c. 2, profession of Protestantism is made the condition of succession to the throne of England. Hence, it is argued, the mediæval popes, in excommunicating sovereigns, and declaring their subjects released from allegiance, did but declare what was, by the public law of the period, the *civil* effect of the exercise of what in them was a *spiritual* authority. By the discipline of the Rom. Cath. Church, kings or queens, and their children, are not included in any general sentence of excommunication, unless they be specially named.

The lowest and simplest form of excommunication—the only form recognized by some opponents of ecclesiasticism—is merely a withdrawal of Christian fellowship, pronounced by a church acting not as a court but as a brotherhood. It is intended not as a *penalty*, but as a protection to the church, and as a warning to the offender with a view to his reclamation.

EXCORIATE, v. *ĕks-kō′rĭ-āt* [L. *excŏrĭātus*, having stripped off skin—from *ex*, out of; *cŏrĭŭm;* Gr. *chorĭŏn*, skin, hide: F. *excorier*]: to wear or strip off the skin; to break the skin by rubbing; to gall or abrade. EXCO′RIATING, imp. EXCO′RIATED, pp. EXCO′RIA′TION, n. *-ā′shŭn* [F.—L.]: the act of wearing or rubbing off the skin; an abrasion.

EXCORTICATION, n. *ĕks-kŏr'ti-kā'shŭn* [F. *excortication*—from L. *ex*, out of; *cortex* or *corticem*, bark]: the act of striping off bark. EXCOR'TICATED, a. stripped of the bark.

EXCREMENT, n. *ĕks'krĕ-mĕnt* [F. *excrément*—from L *excrēmĕntum*, that which passes from the body—from *ex*, out of; *crētus*, separated: It. *escremento*]: matter discharged from an animal body after digestion; dung; filth. EX'CREMENTAL, a. *-tăl*, discharged or voided as excrements. EX'CREMENTIT'IOUS, a. *-mĕn-tĭsh'ŭs*, pertaining to or consisting of matter voided from the animal body.

EXCRESCENCE, n. *ĕks-krĕs'ĕns* [OF. *excrescence*, an excrescence: L. *excrĕscĕntĭă*, morbid excrescences on the body—from *ex*, out of; *crescens* or *crescen'tem*, growing: It. *escrescenza:* F. *excroissance*]: a protuberance or growth on any body; an outgrowth; a superfluity. EXCRES'CENT, a. *-ĕnt*, growing out of, as a superfluity. EXCRESCENT CONSONANTS, term introduced by Prof. Key to designate what before was called Epenthesis.

EXCRETE, v. *ĕks-krēt'* [L. *excrētus*, sifted out, separated (see EXCREMENT)]: to separate and throw off; to discharge from the body; to strain out. EXCRE'TING, imp. EXCRE'TED, pp. EXCRE'TION, n. *-krē'shŭn* [F.—L.]: a throwing off or voiding matter from an animal body; any matter excreted; a discharge from the bowels (see SECRETION). EXCRETA, n. plu. *ĕks-krē'tă*, the dung of animals. EXCRETIN, n *ĕks'krĕ tĭn*, a crystalline slightly alkaline substance said to be found in fresh nightsoil or excreta. EXCRE'TIVE, a. *-tĭv*, having power to eject certain matter from the body. EXCRE'TORY, a. *-tėr-ĭ*, having the power to excrete: N. a duct or vessel which conveys secreted fluid from a gland. EXCRETOLIC, a. *ĕks-krē'tŏ-lĭk*, denoting an acid said to be obtained from fresh nightsoil. EXCRETORY ORGANS, n. in *anat.*, the organs by which excretion takes place; specifically, the skin, the lungs, and the kidneys.

EXCRIPT, n. *ĕks'krĭpt* [L. *exscriptus*, pp. of *exscribo*, I write out]: in *law*, a copy, a writing copied from another.

EXCRUCIATE, v. *ĕks-krô'shĭ-āt* [L. *excrŭcĭātus*, tortured greatly—from *ex*, out of, very much; *crŭcĭātus*, tortured—from *crux*, a cross]: to torment; to torture; to inflict severe pain on. EXCRU'CIATING, imp.: ADJ. extremely painful; agonizing. EXCRU'CIATED, pp. EXCRU'CIA'TION, n. *-ā'shŭn*, extreme pain; torture.

EXCUBITORIUM, n. *ĕks-kū-bĭ-tō'rĭ-ŭm* [L.—from *excubo*]: in *arch.*, a gallery or loft in a church where watch was kept at night on the eve of any great festival, and from which the great shrines were observed.

EXCUDIT, v. *ĕks-kū'dĭt* [L.—from *excudo*, I engrave]: he engraved it; word placed at the bottom of an engraving, preceded by the name of the engraver.

EXCULPATE, v. *ĕks kŭl'pāt* [L. *exculpātus*, cleared of blame—from *ex*, out of; *culpă*, blame: It. *colpare*, to blame, to censure]: to clear by an explanation from the charge of a fault or of guilt; to excuse; to clear from blame; to justify;

to exonerate. Excul'pating, imp. Excul'pated, pp. Ex'culpa'tion, n. *-pā'shŭn*, the act of vindicating from the charge of a fault or crime; an excuse. Excul'patory, a. *-pă tėr-ĭ*, clearing from the charge of a fault. Letters of exculpation, in the *law of Scotland*, warrants granted to the accused party in a criminal prosecution, to enable him to cite and compel the attendance of such witnesses as he may judge necessary for his defense.

EXCURRENT, n. *ĕks-kŭr'rĕnt* [L. *ex*, out of; *currentem*, running]: in *bot.*, running out beyond the edge or point; applied to the central stem of a tree with the branches surrounding it in regular order, as in a fir-tree.

EXCURSION, n. *ĕks-kėr'shŭn* [F. *excursion*—from L. *excursĭōnem*, a running out or forth—from *ex*, out of; *cursus*, a running: It. *escursione*]: a pleasure-trip; a short tour; a ramble; a digression; a wandering from the subject or main design. Excur'sionist, n. *-shŭn-ĭst*, one travelling to a place for pleasure. Excur'sive, a. *-sĭv*, rambling; wandering. Excur'sively, ad. *-lĭ*. Excur'siveness, n. the act of wandering. Excursus, n. *ĕks-kėrs'ŭs* [L. a running out or forth]: added notes containing additional information on certain points; a digression; a less formal dissertation.—Syn. of 'excursion': tour; jaunt; journey; expedition; trip.

EXCUSE, n. *ĕks-kūs'* [F. *excuse*, an excuse; *excuser*, to excuse—from L. *excusārĕ*, to free from blame—from *ex*, out of; *causa*, a cause, a suit: It. *escusare*]: that which excuses or justifies; a plea offered in extenuation of a fault; an apology: a pretext: V. *ĕks-kūz'*, to pardon; to overlook on giving an explanation or apology; to disengage or free from an obligation; to justify. Excu'sing, imp. Excused', pp. *-kūzd'*. Excu'ser, n. *-kū'zėr*, one who. Excu'sable, a. *-ză-bl*, pardonable; admitting of excuse. Excu'sably, ad. *-blĭ*. Excu'sableness, n. *-bl-nĕs*, the state of being excusable. Excu'satory, a. *-tėr-ĭ*, containing an excuse or apology. Excuse'less, a. *-kūs'lĕs*, that for which no excuse or apology can be offered.—Syn. of 'excuse, n.': justification; exculpation; defense; plea; pretense; release; acquittal; absolution;—of 'excuse, v.': to acquit; free; release; exculpate; absolve; forgive; overlook; remit; relieve.

EXE, *ĕks:* river of the s.w. of England, rising in Exmoor, in the w. of Somersetshire, flowing 19 m. s.e. to the borders of Devonshire, and then 35 m. s. through the e. part of that country into the English Channel at Exmouth. The lower five miles form a tideway a mile broad at high water, with wooded and picturesque shores, and navigable for large vessels. The chief tributaries are the Barle, 24 m. long, Batham, Loman, Culm, and Creedy. The E. passes Dulverton, Brompton, Exeter, and Topsham. It has a clear and merry current through wooded and romantic vales.

EXEAT, n. *ĕks'ē-ăt* [L. *exĕăt*, let him go out—from *ex*, out of; *ĕō*, I go]: a bishop's permission to a priest to leave his diocese; permission to a student to leave his residence in his college.

EXECRATE, v. *ĕks'ĕ-krāt* [L. *exsĕcrātus*, accursed—from *ex*, out of; *săcrō*, I devote or doom to destruction: It. *esecrare*: F. *exécrer*, to execrate]: to detest utterly; to abominate; to denounce evil against; to curse. Ex'ecrating, imp. Ex'ecrated, pp. cursed; denounced. Ex'ecrable, a. *-kră-bl* [F.—L.]: very hateful; detestable. Ex'ecrably, ad. *-blĭ*. Ex'ecra'tion, n. *-krā shŭn* [F.—L.]: the expression of utter detestation; imprecation of evil.

EXECUTE, v. *ĕks'ĕ-kūt* [F. *exécuter*—from L. *exsĕcūtŭs*, followed to the end—from *ex*, out of; *secūtŭs*, followed]. to carry into complete effect; to perform; to inflict; to put to death by form of law; to complete, as a legal document. Ex'ecu'ting, imp. Ex'ecuted, pp. Exĕc'utant, n. *-tant*, one who performs; a performer, as an *executant* on the piano. Executer, n. *ĕks'ĕ-kū-tėr*, one who performs or does a thing; in *OE.*, one who inflicts the punishment of death; an executioner. Ex'ecu'tion, n. *-kū'shŭn* [F.—L.]: performance; mode of performing or carrying into effect; a legal warrant or order; signing of a deed; capital punishment; destruction; effect produced: in the *law of Scotland*, attestation by a messenger-at-arms (q.v.), or other officer of the law, that he has given a citation, or carried through a diligence (q.v.), in terms of the warrant of the judge. It corresponds to an affidavit of service of writ or summons in the common-law courts, and of a bill or claim in chancery: see Evidence. Ex'ecu'tioner, n. *-shŭn-ėr*, he who puts to death by legal warrant; a hangman (see Capital Punishment). Execution of the death-sentence (see below). *Military and Naval Executions* are usually by either hanging or shooting: see Punishments, Military and Naval: Mutiny Act. Executive, n. *ĕgz-ĕk'ū-tĭv*, the person or body in the administration of a country who puts the laws in force—thus distinguished from the legislative and judicial bodies; the governing person or body (see Administration, in Politics: Executive Department: Government): Adj. pertaining to the governing body; having the power to put the laws in force; not legislative or judicial; active. Exec'utively, ad. *-lĭ*. Exec'utor, n. *-tėr*, a person appointed by a testator to carry out his will. Exec'utrix, n. *-trĭks*, a woman so appointed Exec'utorship, n. the office of an executor. Executry, n. *ĕgs-ĕk'ū trĭ*, in *Scotch law*, general name for all the movable estate and effects of a deceased person (except the heirship movables), being the proper subject of the executor's administration. Exec'uto'rial, a. *-tō'rĭ-ăl*, pertaining to an executor. Exec'utory, a. *-tėr-ĭ*, performing official duties; having authority to put the laws in force. Executable, a. *ĕgz-ĕk'ū-tă-bl*, capable of being accomplished; feasible. Executor dative, *ĕgz-ĕk'ū-tėr* [*dative*, given or assigned—from L. *datus*, given]: in *Scot.*, an officer or executor legally appointed to administer a deceased intestate's movable estate on behalf of all concerned. Executor de son tort, in *law*, 'if a stranger takes upon him to act as *executor*, without any just authority, as by intermeddling with the goods of the deceased, and many other transactions, he is called in law an *executor* of his own wrong, *de son tort*, and is liable to all the trouble of an executorship; but merely locking up the goods, or burying the corpse of the deceased, will not amount to such an intermeddling as will charge a man as *executor* of his own wrong.'—*Blackstone.* EXECUTOR NOMINATE, the person who had been appointed by deceased.—SYN. of 'execute': to accomplish; effect; achieve; fulfil; consummate; finish.

EXECUTIONER: the official who executes the sentence of capital punishment. (It is common, and convenient, to speak of him as executing the criminal: strictly, it is the *sentence* or the penalty that he executes). In England, and in the United States, it is the province of the sheriff to perform this as well as every other ministerial duty enjoined by the criminal courts, but practically he acts by his servants or officers, and he only attends to see the law properly carried out. In royal burghs in Scotland, this duty is imposed on the civic magistracy, one of whom attends for the purpose. In times happily gone by, so numerous were the public executions in Britain, that almost every county and town had its executioner, as an acknowledged officer of justice, with a salary for his subsistence. Yet, we learn that on certain occasions, so odious and so onerous was the duty to be performed, that a special executioner was employed. Such was the case at the execution of Charles I. The task of putting this unfortunate monarch to death is well known to have been performed by two men, who, from a dread probably of the vengeance of the Royalists, had concealed their faces under visors. In consequence of the mystery thus assumed, public curiosity was much excited, and several persons fell under the suspicion of having been concerned in the bloody deed; rumor even went so far as to decide who was the wielder of the axe, and who held up the head, It cannot be said, however, that any certainty was ever arrived at on the subject. See *Chambers's Edinburgh Journal*, first series, IV. p. 317.

Like many other offices, that of executioner seems to have been at one time hereditary in England. Shakspeare, in *Coriolanus* (act. ii. scene 1), makes Menenius, one of the characters in the play, speak of 'hereditary hangmen.' In several German states, the office of Headsman (q.v.) also is said to have been hereditary; certain families being thus, as it were, condemned to perpetual infamy. The last headsman of the Tower of London died 1861. The office was latterly a mere sinecure, and has not been filled. In some parts of England, the office was annexed to other posts; for instance, the porter of the city of Canterbury was executioner for the county of Kent, in the time of Henry II. and Henry III., for which he had an allowance of 20*s*. per annum from the sheriff, who was reimbursed by the Exchequer. The sum of thirteenpence halfpenny was long popularly spoken of as 'hangman's wages;' such sum, equal to a merk Scots, being the fee at one time paid to the executioner when he officiated. In the 17th c., this sum, small as it now appears, was considerably above the wages of a skilled mechanic.

From Gregory Brandon, the London excutioner in the reign of James I., the name Gregory was employed as a familiar designation for executioners for a considerable period. Brandon had the address to procure a coat-armorial from the College of Heralds, and became an esquire by virtue of his office. One of his successors was named Dun, or 'Squire Dun,' as he was called. Dun is referred to in Butler's *Ghost*, 1682:

> For you yourself to act 'Squire Dun,'
> Such ignominy ne'er saw the sun.

He was succeeded about the above year by John or Jack Ketch, commemorated by Dryden (*Epilogue to the Duke of Guise*), and his name has since been synonymous with hangman.—Cunningham's *Handbook of London*, article Tyburn.

Executioners have, in some instances, come to trouble. Sentence of death was executed on John Price, the London executioner, 1718, May, 31, for murder. In the account, it is stated that one day, on returning from Tyburn, he was arrested for a debt, which he discharged by a small sum in his pocket, with the proceeds of the clothes of three felons whom he had just then put to death.—*Old Bailey Chronicle*, i. p. 147. If this work can be credited, the executioner was about the same time arrested while accompanying John Meff, a criminal, to Tyburn. This arrest, which is amusingly depicted in an engraving, stayed the execution of Meff; being conducted back to Newgate, his sentence was commuted to transportation for seven years, but having returned to England before the period expired, he was taken and the sentence was executed. In 1736, May 24, the executioner, on returning from Tyburn, after executing sentence on five felons, picked the pocket of a woman of 3*s.* 6*d.* (Hone's *Every-Day Book*, ii. p. 695), but what was his punishment is not related. In 1682, Alexander Cockburn, hangman of Edinburgh, was put to death for the murder of a Bedesman, or privileged mendicant. Early in the 18th c., the executioner of Edinburgh was John Dalgliesh, who acted at the execution of the sentence of Wilson the smuggler 1736, and is alluded to in the *Heart of Mid-Lothian*. It was he also who officiated at the death of the celebrated Maggie Dickson, a woman condemned 1738 for infanticide, but who came to life again after enduring the sentence of the law, and lived unmolested for years afterward, as a hawker of salt in the streets of Edinburgh. It is said of Dalgliesh, that, in whipping a criminal, he made a point of laying on the lash 'according to his conscience,' which showed him to have been a most considerate executioner. John High, or Heich, accepted the office of Edinburgh executioner 1784, in order to escape punishment for stealing poultry; he died 1817. See *Traditions of Edinburgh*, by R. Chambers. The emoluments of the Edinburgh executioner at one time comprehended a recompense in kind in the markets of the city—viz., a *lock* or handful, and a *gowpen* or double handful, of meal from each sack; hence he received the designation of *lockman*. These emoluments were latterly commuted into a regular salary of 12*s.* per week, besides a free house, and a special fee of £1, 11*s.* 6*d.* at each execution; from the Exchequer also the executioner received a small annual allowance as Deemster (see under DEEM). The last of the Edinburgh executioners was John Scott, whom it was customary to confine in jail for eight days previous to an execution, in order to insure his attendance; the expenses incurred by him during one of the periods of seclusion being, as we find, £1, 2*s.* 6*d.*, which sum was discharged by the city. Scott was killed by a malicious assault 1847. Since this period, Edinburgh has had no regular hangman, but, like all other places in Great Britian, depends on the London executioner, who is hired for the occasion. This personage, until lately, was the well-known William Calcraft. For an execution at Edinburgh 1854, Calcraft's fee and expenses amounted to £33, 14s.; his assistant received £5, 5*s.*; and for taking charge of both, the city criminal officers were paid £1, 1*s.*: total expenses for the execution, £40, independently of the cost of erecting the scaffold. In 1815, the magistrates of Glasgow entered into an arrangement by stamped indenture with Thomas Young, who engaged to act as executioner at a recompense of £1 per week, a free house, with coal and candles, a pair of shoes and stockings once a year, and a fee of a guinea at each execution. At Young's death, 1837, his successor, John Murdoch, was recompensed differently. He was paid £1 per month, by way of retainer, and the sum of £10 for an execution. After his death, Calcraft officiated, he in turn having been succeeded by Marwood. Besides the usual fees, executioners have from early times claimed the clothes of those who suffer, as a perquisite of office.

The most noted executioner of Paris was the late M. Sanson, who officiated at the mournful death scene of Louis XVI,, and is said to have possessed acquirements and feelings not to be expected from one of his degrading profession. He was latterly assisted by his son, Henri Sanson. See *Memoirs of the Sansons* (1875). The Parisian executioner is familiarly styled 'Monsieur de Paris.'

No professional executioner is employed at capital punishments in the United States. Here the sentence is executed by the sheriff, with the assistance of an under-jailer; this last official performing the fatal toilet of the criminal, while the sheriff, by a movement affecting the drop, puts him to death in virtue of the sentence and the law of the State. This seems an advance on the practice in England, where, however, it could not be introduced, for the reason, that the sheriff there being a magistrate, no one fit for the rank of sheriff or magistrate would accept of office with an obligation to perform the duty of executioner in person. The military executioner attached to an army is styled provost-marshal (q v.).

EXECU'TION OF DEED: performance of the ceremonies required by law in order to make a deed binding and effectual. These ceremonies in England consist in signing, sealing, and delivering. According to the ancient common law of England, signature was not necessary to a deed. By 29 Car. II. c. 3 (statute of Frauds), signing was required for almost all deeds. When a party, from any cause, is unable to write, it is usual for him to place his mark in the place of signature. But a mark is unnecessary, and signature by another, at request of the party, is enough. Sealing is the most ancient form of authentication of deeds. In England, deeds are technically known as deeds under seal. A seal is absolutely essential to the validity of an English deed, but any species of seal is sufficient, and in practice a common wafer is usually appended. Delivery is the third requisite to authenticate a deed. Delivery may be made either to the grantee or to another person for him. In the former case, the deed becomes absolute; in the latter, it is called an *Escrow*, and does not acquire its full effect till the conditions are fulfilled. Witnesses are not absolutely required to a deed in England, but in practice it is usual that one witness should attest Before execution, a deed must be read, if required, by a party to it; and if not read, it is void as to the party requesting. Where a person is ordered in Chancery to execute a deed or other instrument, and is in prison for failure to comply with the order, the court may make an order that the instrument be executed by the officer of the court; and the execution having been so made, the instrument is equally valid as if signed by the party. In the execution of wills in England it is required that every will shall be signed at the foot or end by the testator in presence of two witnesses: see WILL.

In Scotland, sealing was formerly an essential requisite for execution; but that practice was dispensed with in regard to registered deeds, and has long fallen into disuse. The signature of the maker of the deed is required, and the presence of two witnesses. If the maker of the deed cannot write, the deed is signed in his presence by two notaries, in presence of four witnesses; a will, by one notary with two witnesses. Subscription by initials has been permitted in Scotland, but is irregular, and requires proof that *de facto* the signature was so made. A deed or other instrument the whole or the essential parts of which are holograph, i e., in the testator's handwriting, is valid without witnesses. Bills and promissory-notes, receipts, and mercantile accounts do not require to be holograph or attested.

In the United States, a deed is not good against a subsequent purchaser, except it be acknowledged before the proper official, and duly recorded by the public registrar appointed for such office. The law varies as to witnesses; in some states acknowledgment before a magistrate suffices without witnesses; in others one witness, and in still others two, are required.

EXECUTION OF THE DEATH SENTENCE: capital punishment (q.v.). Executions took place publicly in the British Kingdom till 1860, when an act of parliament was passed requiring that they should take place within the precincts of a prison, in the sight of certain officials newspaper reporters, and others invited to be present. The United States (to some extent), Bavaria, and the colony of Victoria had previously adopted this method. The lack of that terror with which public executions were supposed to strike the multitude is, by this private procedure, held to be more than compensated by the prevention of a brutalizing public spectacle. In London, executions took place for the most part at Tyburn until 1783, when a scaffold erected in front of Newgate prison became the common place of execution. 'The gallows was built with three cross-beams for as many rows of sufferers; and between 1785, Feb. and Dec., 96 persons suffered by the "new drop," substituted for the cart. About 1786, here was the last execution followed by burning the body; when a woman was hung on a low gibbet, and life being extinct, fagots were piled around her and over her head, fire was set to the pile, and the corpse burned to ashes. On one occasion the old mode of execution was renewed: a triangular gallows was set up in the road opposite Green-Arbour Court, and the cart was drawn from under the criminal's feet.'—Timbs's *Curiosities of London.* To render executions more impressive, they were in some cases ordered to take place near the scene of guilt. About 40 years ago, two men were hanged at Bishopbriggs, near Glasgow, in sight of the scene of a murder that they had committed. The ordinary place of execution in most towns in Great Britain and Ireland is outside the prison. At Edinburgh, executions took place chiefly in the Grassmarket, until 1784, when they were transferred to a platform at the w. end of the Tolbooth, a building removed in 1817. The interval between sentence and execution is about three weeks, the nature of the crime not making any difference in this respect. In all parts of the British Empire, the convict under sentence of death is allowed to make choice of the spiritual adviser who shall attend on him; and generally, everything that humanity can suggest is done to assuage the bitterness of his fate. At one time, the bodies of murderers after execution were, in terms of their sentence, delivered to professors of anatomy for dissection; and it appears that in some instances the mangled corpse was made a kind of public show. Thus it was at the execution of Earl Ferrers, 1760. The body having been conveyed from Tyburn in his lordship's landau-and-six to Surgeon's Hall, was, after being disemboweled and laid open in the neck and breast, exposed to public view in a first-floor room. A print of the time depicts this odious exhibition. The ordering of the bodies to be dissected, having led to great abuse, was abolished 1832; since this period, the bodies of murderers are buried within the precincts of the prison, and the bodies of other malefactors are given to their friends: see ANATOMY (in Law). It was also at one time customary to hang the bodies of certain malefactors in chains after execution—as, for example, the bodies of pirates were so hung on the banks of the Thames—but this usage, revolting to public feeling, is likewise abandoned. From the improved state of the criminal law, death sentences are now comparatively rare, and still more rarely are such sentences executed, for, except in cases of deliberate and aggravated murder, the extreme sentence of the law is now usually commuted by the crown into penal servitude for life. The secretary of state for the home department, however, exercises his power in this respect with much care and discretion; and the element of arbitrariness, which might be supposed to spring from differences of temper in different home secretaries, is very seldom obvious.

A great change took place in the public attendance at executions before they were discontinued. Formerly, persons belonging to the higher and middle ranks were habitually present at these dismal exhibitions; many hiring windows at a considerable sum for the occasion. Literature furnishes us with various instances of persons of cultivated mind attending regularly from a morbid love of the spectacle. George Selwyn was fond of seeing executions. His friend Gilly Williams, writing to him of the condemnation of John Wesket (1765, Jan. 9) for robbing the house of his master, the Earl of Harrington, says: 'Harrington's porter was condemned yesterday. Cadogan and I have already bespoke places at the Brazier's. I presume we shall have your honour's company, if your stomach is not too squeamish for a single swim.'—Selwyn's *Correspondence*, I. p. 323. The Earl of Carlisle, writing to Selwyn, speaks of having attended the execution of Hackman, a murderer. 1779, April 19.—*Ibid.* IV. p. 35. James Boswell, biographer of Johnson, had a passion for seeing executions, and even for accompanying criminals to the gallows. He was indulged with a seat in the mourning coach to Tyburn, with the above named Hackman, the ordinary of Newgate, and sheriff's officer. Visiting Johnson, 1784, June 23, he mentions that he has just come from the shocking sight of 15 men hanged at Newgate.—Boswell's *Johnson*, VIII. p. 331, Croker's edition. At public executions there were to the last considerable crowds, but they consisted chiefly of the lowest of the population. During the excesses of the French Revolution, the executions in Paris were enjoyed as a spectacle by crowds of female Jacobins. From the circumstance of these furies employing themselves with knitting needles while attending daily at the scaffold, they became familiarly known as the *Tricoteuses* (Knitters).

In most of the states of the American Union, the laws direct that the E. of the death sentence shall take place within the precincts of prisons; but in some s. states the act is performed in an open field, in full view of the multitudes that eagerly attend such exhibitions. For the crimes punishable with death under the laws of the several states of the American Union, see in general, CAPITAL PUNISHMENT.

The mode of the E. of the death penalty is throughout the United States that of hanging, except in N. Y. In 1888 the legislature of that state changed the form of E. of the death penalty from hanging to electricity. Soon afterward, William Kemmler, convicted of murder in the first degree, was sentenced to suffer death by the application of electricity, which was deemed much less revolting to humanity than death by the usual mode of hanging. The prisoner's counsel, claiming that such form of punishment was of the 'cruel and unusual' class prohibited by the state constitution, applied for a writ of *habeas corpus* for the purpose of testing the constitutionality of the new law. A great mass of testimony on this application was taken in New York during the summer 1889. The merits of the alternating and continuous currents produced by the systems of rival corporations were advocated and disputed by experts; the amount of voltage necessary to produce instantaneous death under favorable and unfavorable conditions was variously asserted; and the results of many experiments with different animals were detailed. Oct. 9, the judge, after reviewing at length the testimony in the case, decided that the new law was constitutional; and Dec. 30 the general term of the fifth judicial dept. reaffirmed this decision. While the question of constitutionality was being thus tested, preparations were in progress in the Auburn state prison to carry out the sentence of death during the week beginning 1890, Apr. 28, and the 30th was chosen for the day. The night previous, however, the warden of the prison was served with a writ of *habeas corpus* sued out by the convict's counsel in the U. S. circuit court; and the infliction of the death penalty was thus deferred, awaiting a decision by the court. This writ having been dismissed, the culprit was again sentenced, July 3, to die during the week beginning Aug. 4. The sentence was executed 1890, Aug. 6, in the Auburn prison.

The death chamber, 17 x 25 ft. in size, contained the death chair; a board to which were attached the mechanical appliances for testing, measuring, and governing the current; a Cardrews voltmeter; a box containing a current-reducing coil; a switch between the voltmeter and the reducer; a box containing 24 16-candle-power incandescent lamps to show when the current was running steadily; two switches for short-circuiting the current and for carrying it to the wires at the death chair; an electric push-button for signalling with the dynamo room, 1,000 ft. distant; and two wires connecting directly with the dynamo. The death chair had a sloping back and broad arms, with straps to bind the prisoner's arms, feet, and chest to the chair. Attached to the back of the chair was a figure-4-shaped wood frame, adjustable to the height of any prisoner's head, one portion of the frame passing over and beyond the head. It was first designed to have the current pass through the prisoner from head to foot, but afterward it was deemed best to send the current from the head to the small of the back. Accordingly small rubber disks, containing a plate of metal, a sponge, and a coil of copper wire, were prepared, to be placed on the head and at the base of the spine. One of the long wires passed through the wood projection over the head to the rubber disk on it, and the other to the disk placed against the spine.

The manner of the execution in this case was as follows: The convict having been strapped in the chair, and the electrodes having been fitted to the vertex and the base of the spine respectively, the current of electricity was turned on. The face and hands of the convict first turned deathly pale, then dark red; the fingers seemed to grasp the chair with a firmer hold, and the nail of the index-finger of the right hand cut into the palm. The current had flowed abt. 17 seconds when a physician declared the man dead, and the machinery was instantly stopped; but that moment the man gave, or seemed to give, signs of life and of intense suffering: a deep groan came from his lips, and there was a violent struggle for breath; the body relaxed and grew limp, and foam came from the mouth. The current was again turned on and kept up for 2 minutes, intermittently: the man was then pronounced dead; the electrode had burned the flesh deeply at the base of the spine. One of the physicians present at the execution declared the signs of life and voluntary movement, observed after the current had first been stopped, to be merely reflex movements—'similar to those which have occasionally been observed, for a short time, in animals experimentally killed by electricity, after the current was too quickly interrupted, the animal, however, not recovering consciousness nor life; hence they may properly be regarded as involuntary muscular movements of a reflex character, following the interruption of the current, and in no sense a resumption of normal respiration, however much they may appear to be so to a superficial observer, or to one not familiar with the phenomena in animals above referred to. These movements are as nothing compared with those usually exhibited by animals suddenly decapitated, and which usually continue for some seconds or even minutes. If there was a spark of unconscious vitality remaining in the body after the first contact was broken—there certainly was no conscious life—it was absolutely extinguished the instant the second and last contact was made.'

See CAPITAL PUNISHMENT: DROWNING: GUILLOTINE: HANGING: MAIDEN: NEWGATE: PARRICIDE: PEINE FORT ET DURE: PRESSING TO DEATH: TYBURN: WHEEL (BREAKING ON THE): also EXECUTIONER.

EXECUTION ON CIVIL PROCESS: method whereby the English High Court enforces its judgment on the person or estate of those against whom judgment has been given. The common law of England allows four different writs to issue against refractory debtors—viz., a *fieri facias* (called commonly a *fi. fa.*), by which goods and chattels of a debtor may be attached; a *capias ad satisfaciendum* (*ca. sa.*), directed against the person of a debtor (not a privileged person)—regarded as the last remedy, involving imprisonment till the debt is paid, and not issued unless fraud is involved; *levari facias* directed against a man's goods and the profits of his lands (now seldom used); and *elegit*, a writ of very ancient date, directed against the lands themselves: see

ELEGIT. In the chancery division of court, execution against the person is by writ of attachment: see ATTACHMENT, in Law. In all cases execution may issue immediately, each writ being renewable after a year, within six years; but the court or judge can stay execution to a time fixed—or subject to conditions.

Execution for debt in Scotland, or as it is technically expressed, diligence in execution, is either real or personal: by the former, the debtor's land may be attached; by the latter, his person and his movables. In the case of bonds and other instruments registered for execution (see REGISTRATION), the law allows summary diligence to proceed, without further application to the court. Diligence against heritage includes INHIBITION: ADJUDICATION: RANKING AND SALE: POINDING OF THE GROUND: Personal diligence is by HORNING AND CAPTION: ARRESTMENT: and FORTHCOMING: see these several titles.

In the United States the term 'execution' is generally used to denote the act of carrying into effect the final judgment of a court, or the writ given to an officer, usually a sheriff, constable, or marshal, authorizing him to enforce such judgment. A judgment, however, does not always form the basis of the writ, for under certain statutes the writ may be issued without first obtaining a judgment. As a general rule the word 'execution' is used to signify 'a writ issued to enforce a judgment or order of a court of law' (Freeman on Executions). The writ follows the judgment and commands the officer to do the things which will make it effectual, but it cannot exceed the judgment. Upon money-judgments there is usually but one form of writ employed whether to reach real estate or to reach personal property, and in it the officer is commanded to levy upon the personal property. If that is insufficient he is directed to seize the real estate. At the present day, it may safely be asserted, that the right of a court to issue a judgment necessarily carries with it the right to award an E. to enforce the same, unless this right is expressly restrained by statute. In some cases E. may be issued out of a court other than that in which the judgment originated. This is done by first filing a transcript of such judgment with an officer designated by law. E. can issue only upon final judgment, which must be sufficiently definite in all essential respects. An E. may be issued against any person who would be bound by the judgment. To this rule, however, there are exceptions as in the case of certain municipal officers and persons acting in representative capacity. In a proper case, to avoid abuse, parties may be prevented from issuing E. by what is known as a 'stay of execution.' Sometimes the defendant is required to give security before a stay will be granted. After an E. has been once issued, and it is necessary to issue another, it may be done, and it is then called an *alias.* Writs issued after the *alias* are known as pluries writs. The remedy against an E. improperly issued, is a motion to set the same aside.

At common law, all the debtor's personal property which could legally contribute to satisfy the judgment and all legal interests in lands held by him were subject to E., but in most of the American states, exemption laws have been enacted which are liberally construed and which—to shield the debtor and his family from immediate want—reserve from the effect of an E. certain household furniture, tools, provisions, and the like. If proper formalities have been complied with, a certain designated amount of real estate called a 'homestead' also is exempted.

The bringing of the property by the officer under control of the E. is known as a 'levy.' Upon personal property, depending largely upon its nature and the circumstances, the officer makes a levy by going where such property is situated, keeping it in view and assuming or asserting dominion over it. The levy to be valid must not be secret. But it is not necessary that the property be taken out of the defendant's custody. Levies upon real estate are not to be made until the personal property has been first levied upon. In the case of real estate, under very diverse practice in the different states, the officer does not usually go upon the land, but either advertises the same for sale, or makes an entry upon the writ descriptive of the premises, or files in the proper office a copy of the writ with a notice to the effect that the real estate has been attached. Sometimes he is required to post a notice upon the land and in other conspicuous places, or to deliver a copy of the writ to an occupant of the property. Executions against the person are allowed in the different states in cases of fraud, embezzlement, personal actions, and when there is danger that the defendant will leave the state with intent to defraud his creditors, or when he conceals his property with like intent. Executions awarding the possession of real or personal property also are allowed. These are usually called 'writs of possession.' In carrying out such writs, the officer is vested with all powers requisite to accomplish his purpose, and may if necessary use force.

EXECUTIVE DEPARTMENT: branch of a national, state, or municipal govt., or of a corporation; having charge of the enforcement of laws, ordinances, rules, resolutions, and other directions of the superior body from which it derives its existence and powers. In the U. S. govt., the president is the chief of the E. D., and is assisted by the secretaries of the depts. of war, navy, treas., state, interior, agriculture, commerce and labor, and the postmaster-gen. and atty.-gen., *i.e.* 'the president's cabinet.' Through these secretaries and under the entire control and direction of the pres., all the business of the govt. is carried on, the statutes enforced, and the special laws of congress put into operation. Each subordinate dept. is subdivided into minor ones, usually called Bureaus, according to the exigencies of its particular service, and the officers in charge of them are directly responsible to the sec. of the dept., and he in turn to the pres., who is frequently designated 'the chief executive.' The same general custom prevails in the states and principal cities, the gov. and mayor being the chief executives, and having various officers to assist in the administration.

EXECUTOR OF A WILL: the person to whom, by the testator's own appointment, has been committed the execution of a last will and testament. If the person is a woman she is styled 'executrix.' Where a person dies without having left a will, or has left a will but appointed no E., or an E. has been appointed who is incapable of acting as such, or who refuses to act, or has acted but partially, an administrator may be appointed by a court, having jurisdiction of probate matters The E. is said to derive his authority from the will, while the administrator's power is created by the order of a court. Many of the historical distinctions between these two classes of officers, have in the development of the law become obliterated. Though the techincal distinctions as to the name are preserved in the law, at present the duties of executors and administrators are substantially the same, except that if no will at all was made, the intestate's estate is divided according to some statute prescribed by the state, while in the case of a will, the distribution takes place in the manner directed by the will. A manifest advantage however is secured to the estate of a dying person by making a will and appointing executors, since in such a case, a possible conflict as to who shall carry out the wishes of the deceased may be avoided. Furthermore such executors, on making probate, are not usually required to give bonds, while administrators appointed by the court are always required to furnish security. A will however, is not made void by reason of a failure to appoint therein an executor. Originally the operation of wills was confined exclusively to personal property, and the E. or administrator had nothing to do with the deceased person's real estate. This was owing to the rules of the English common law by which real estate at once vested in the heir-at-law upon the death of the owner. At present in the United States, while personal property still remains the basis around which the E.'s and administrator's functions are concentrated, they may be called upon to exercise a certain supervision over real estate where the E. is in fact directed to do so in the will, or where, by reason of a deficiency of personal assets the real estate of the deceased is applied in payment of the latter's debt.

In a general sense, it may be said that whoever is capable of making a will, is capable of acting as E. The court however, in the interests of creditors and legatees, have power either to remove an obviously incompetent E. or on cause shown to exact security from him. The executorship being a personal matter cannot be assigned to anybody else, and upon the death of the E. his duties will be performed either by the surviving executors, if more than one was originally appointed, or by an administrator to be selected by the court, with due regard to all the circumstances of the estate. The E., though he derives his power primarily from the will, is not officially recognized until the will is admitted to probate and his authority confined by the issuance to him from the court of what are termed 'letters testamentary.' In the case of an administrator they are called 'letters of administration.' In case of administration, no probate is made. A person who without authority officiously intermeddles with the estate of the deceased, is styled an 'executor de son tont' (executor of his own wrong). Such a person, if not acting in good faith, is liable to persons injured by his acts to the extent of the property which he may have taken or the actual damage caused by him.

The duties of the E. and administrator are to make and file an inventory of the deceased's property, to pay his debts and funeral expenses, collect all his assets, and distribute the same among those entitled thereto. They must at all times keep accurate accounts of their doings. They may be compelled to make an accounting during the progress of their trust, also on finally closing the same. In American practice executors and administrators who have faithfully performed their duties are allowed compensation varying in different states, but generally taking the form of commissions on the amounts received and paid out. See for Scotch usage, Dead's Part: Confirmation: Vitious Intromitter.

EXECUTORS, in Scotland: heirs *in mobilibus* (of movable possessions) of a person deceased intestate. They are the whole next of kin in the nearest degree in blood; but where the heir to the heritage is one of the nearest of kin (e.g., the oldest son), he is not entitled to share in the movables without collation (q.v.). See Succession: Movables.

EXEC'UTORY DEVISE', in Law: such a limitation of a future estate or interest in lands or chattels (though in the case of chattels, it is more properly a bequest) as the law admits in the case of a will, though contrary to the rules of limitation in conveyances at common law (Blackstone, *Comm.* ii. 334). By common law, a freehold cannot be limited on a freehold, as an estate to A and his heirs; but if he die before he attain the age of 21, then to B and his heirs. Nor can an estate be given to commence at a time uncertain, as to A when he returns from Rome. But though these limitations would be void in a deed, common law will sustain them as executory devises. This form of limitation is restrained by the law against Perpetuities (q.v.), which requires that the estate must take effect within a life or lives in being and twenty-one years after. The law will not interpret a limitation as an executory devise, if it can be otherwise sustained. Within the period allowed for these estates, an executory devise constitutes a species of estate tail; and for this purpose, it is frequently used in America.

EXEDRA, n. *ĕgs'ė dra* or *ĕgs-ē'drâ* [L. *exedra*—from Gr. *ex*, out, without; *hedra*, a seat: F. *exèdre*]: in *antiq.*, the portico of the Grecian palæstra, in which disputations of the learned were held; so called from its containing a number of seats, generally open, like the pastas or vestibule of a Greek house; an assembly-room or hall for conversation; in *arch.*, a niche projecting beyond the general plan of a building; a porch or chapel projecting from a large building; a recess of a building

EXEGESIS, n. *ĕks′ĕ-jē′sĭs* [Gr. *exēgēsis*, a leading out, an exposition—from *ex*, out of; *egĕŏmai*, I lead: F. *exégèse*]: critical exposition or interpretation of any writing, but usually, of a portion of Scripture; a paraphrastical explanation of any text or portion of Scripture. Ex′egete, n. *-jēt*, one skilled or practiced in exegesis; an exegetist. Ex′eget′ical, a. *-jĕt′ĭ-kăl*, expository; tending to illustrate or explain; also Ex′eget′ic. Exegetics, n. *-jĕt′ĭks*, proper scientific interpretation, especially of Scripture. Hermeneutics and Exegetics are close allied but not identical. The former lays down the principles of Biblical interpretation; the latter deals with the practical application of the principles. In other words, Hermeneutics is a science, Exegetics is an art. Exege′tist: same as Exegete. Ex′eget′ically, ad. *-lĭ.*—*Exegesis* is applied usually in connection with biblical writings. The expositor or interpreter is called an *exegete*. To interpret a writing, means to ascertain thoroughly and fundamentally what are the conceptions and thoughts which the author designs to express. For this purpose, it is necessary, in regard to books written in a foreign language, that the exegete should know well, first, the precise signification of the words and idioms employed by the writer: this is *grammatico-philological* exegesis. In the next place, he must be acquainted with the things denoted by these words, also with the history, antiquities, and modes of thought of the nation: this is termed *historico-antiquarian* exegesis. Both together constitute *grammatico-historical* exegesis. When only an exposition of the system of thought contained in a writing is sought after, this is termed *doctrinal* or *dogmatic* exegesis; while the investigation of a secret sense, other than that literally conveyed by the words of a writing, is termed *allegorical* exegesis. But if a writing is regarded from a practical point of view, and in reference to its bearing upon life and manners, the exposition is termed *moral* exegesis. The complete and coherent exegesis of a writing forms what is called a *commentary*, but, if restricted to certain difficult words or knotty points, the elucidations are termed *scholia*. The scientific exhibition of the rules and means of exegesis is called *Hermeneutics* (q.v.). In the earliest ages of the Christian Church, the allegorical method of exegesis prevailed. By the Alexandrian school in particular, it was greatly abused. Origen, however, the greatest of this school, has the credit of an endeavor to secure a basis for grammatical exegesis, by a sharp separation of the literal, the moral, and the mystical sense of Scripture Besides the Alexandrian school, the Syrian historico-exegetic school had many adherents in the East. Among these may be mentioned Cyril of Jerusalem, Ephraem Syrus, John Chrysostom, and Theodorus of Mopsuestia. First, toward the end of the 4th, and during the 5th c., a narrowing of the principle of the free interpretation of Scripture begins to be observable, through the rapid development of monkery and the hierarchical system; in consequence of which, the importance of the classic writers was undervalued, and the study of them ultimately abandoned in the Western Church, while a feeling of superstitious reverence, wholly unintelligent and unscriptural, grew up for the letter of the 'Word,' and exegesis, if employed at all, was employed simply to bolster up preconceived views. By and by, independent exegesis was supplanted by the well-known *Catenæ,* consisting of expositions of books of Scripture strung together from the writings of the older church Fathers. In the East, the first of these was got up by Procopius, 520; in the West, by Primasius, 550. Although much was done for the exegesis of the Old Testament by eminent Jewish scholars, such as Solomon Jarchi, Aben-Esra, and David Kimchi, Christian theologians for the most part, knowing only the text of the Vulgate, stuck, during the dark ages, to the interpretations of the Fathers. First in the 12th, 13th, and 14th c., efforts were made by individual scholastics, especially by Abelard, St. Bernard of Clairvaux, Thomas Aquinas, and Nicholas of Lyra, to re-introduce something like a grammatico-historical exegesis of Scripture. But it was mainly to the great revival of letters in the 15th c., and the humanistic scholars whom it produced, such as Laurentius Valla, Erasmus, etc , that an advance in exegesis was owing. The Complutensian Polyglot also exercised a great and beneficial influence. Shortly afterward, the Reformation gave an impulse to exegesis, so powerful, that it is felt at the present day; and, indeed, its effect is far more visible in the recent biblical criticism of Germany than it was in the days of Luther himself. The desire for the unfettered exegesis of Scripture strongly animated the reformers, but, in fact, the long black night of ignorance—known as the dark or middle ages—influenced them too, and disqualified them for framing at once a comprehensive exegetical science. It required two centuries to recover from the effects of mediæval ignorance. The more important Lutheran exegetes are: Luther, Melanchthon, Brenz, Joach. Camerarius, Strigel, Chemnitz, etc.; of the Reformed or Calvinistic school may be mentioned Calvin, Zwingli, Œcolampadius, Bucer, Beza, Bullinger, Grotius, Clericus, etc.; and of the Rom. Catholics, especially Paul Sarpi. During the 17th c., the exegesis of Scripture was for the most part at a stand still, but about the middle of the 18th c. it suddenly revived. This revival is due principally to Joh. Aug. Ernesti (q.v.), and J. Sal. Semler (q v.), who established new principles of criticism and hermeneutics, through which grammatico-historical exegesis once more made its appearance. The labors of Wetstein and Kennicott in regard to biblical MSS. were of immense service. Since their day, till the present, criticism has been constantly at work on the writings of the Old and New Testament. Cognate languages have been more and more profoundly studied; the antiquities of the East, of Egypt, Assyria, Arabia, and other countries, have been investigated, and brought to bear on the subject; the manners and customs in these lands, and which, in some of them, have prevailed from time immemorial; the laws that determine the growth of civilization in nations, and enable us to enter into and comprehend the condition of mind peculiar to races in a primitive stage of development, and to appreciate their modes of thought, and to weigh the value of their literary and religious records—all these have received, and are receiving careful attention from numerous scholars, so that it is not too much to say that we are at the present day better fitted—so far as outward helps go—to understand the real meaning of Scripture, than those who have lived at any other period subsequent to its composition. Among the eminent names in the recent development of biblical exegesis are F. A. Wolf, J. Dav. Michaelis, Eichhorn, Gesenius, Wahl, Bretschneider, Winer, Rosenmüller Hitzig, Hirzel, Ewald, Umbreit, De Wette, Knobel, Lücke, Paulus, Meyer, Olshausen, Hengstenberg, etc. The influence of the *grammatico-critical*, and *critico-historical* exegesis of modern Germany, is beginning to make itself felt in Britain and the United States. Among important contributions to the science recently made by British scholars, are those by Conybeare and Howson, Alford, Stanley, Jowett, Ellicott, etc. In the United States a vigorous and profound class of exegetes is now in training, and will soon show valuable results.

EXELMANS, *ĕks ĕl-mŏng'*, Remy Joseph Isidore, Comte: 1775, Nov. 13—1852, July 22; b. Bar-le-duc: French general. He entered the army 1791, was promoted to capt. 1799, served with distinction in the campaign of Naples under Macdonald and Championnet, and 1801 was attached as aide-de-camp to the staff of Murat. In 1808, while with Murat in Spain, he was arrested and sent to England, where he remained a prisoner three years. He was with Napoleon in the Russian campaign 1812, for his brilliant conduct in which, the emperor created him gen. of division. E. seems to have been esteemed equally under every successive government. On the fall of Napoleon, he was for some time banished from France, but was permitted to return 1819. In 1831 Louis Philippe restored his titles and rank. Louis Napoleon named him grand chancellor of the Legion of Honor, and 1851, March 11, raised him to the dignity of *Maréchal de France.* His death was the result of a fall from his horse.

EXEMBRYONATE, a. *ĕks-ĕm'brĭ-o-nāt,* a.: in *bot.*, not having an embryo. Used of Cryptogamic, or as Richard calls them, Inembryonate plants; so designated from their not possessing a proper embryo like Phanerogams.

EXEMPLAR, n. *ĕgz-ĕm'plėr* [F. *exemplaire*, a pattern, a sample—from mid. L. *exemplārĭŭm;* L. *exemplar*, a pattern —from L. *exemplum*, a sample]: anything to be copied or imitated; a model. Exemplary, a. *ĕgz'ĕm-plėr-ĭ*, serving for a pattern or model for imitation; such as may serve as a warning to others: N. copy of a book or writing. Ex'emplar'ily, ad. *-ĭ-lĭ.* Ex'emplar'iness, n. the state of being a pattern for imitation.

EXEMPLIFY, v. *ĕgz-ĕm'plĭ-fī* [L. *exemplum*, a sample, a copy, a transcript; *făcĭō*, I make]: to show or illustrate by example. Exem'plifying, imp. Exem'plified, pp. *-fīd.* Exem'plifier, n. one who. Exem'plifica'tion, n *fĭ-kā'shŭn*, the act of illustrating; an illustration by example, an attested copy.

EXEMPLI GRATIA, *ĕgz-ĕm'plī grā'shĭ-ă* [L. *grātĭă*, for the sake; *exemplī*, of example]: for instance; contracted into Ex. gr., or more usually into E. g.

EXEMPT, a. *ĕgz-ĕmt'* [F. *exempter*, to exempt, to free—from L. *exemptus*, taken out, freed—from *ex*, out of; *emptus*, bought]: not liable to; free from any service, tax, evil, etc.; not included: V. to free from any charge, burden, evil, etc.; to privilege. Exemp'ting, imp. Exemp'ted, pp. Exemp'tion, n. *-ĕm'shŭn* [F.—L.]: freedom from any service, charge, evil, etc., to which others are subject; privilege.

EXENCEPHALOUS, n. *ĕks-ĕn-sĕf'a-lŭs* [prefix *ex*; Gr. *engkephalos*, within the head, the brain]: in *anat.*, malformed human being or animal in which, from defect in the cranium or skull, the brain is visible or even protrudes.

EXEQUATUR, n. *ĕks'ĕ-kwā'tėr* [L. *exĕquātŭr* for *exsĕquātur*, let him perform]: a written authority whereby a consul or commercial agent may be recognized.

EXEQUIES, n. plu. *ĕks'ĕ-kwĭz* [L. *exsĕquĭās*, the following a corpse, a funeral procession or rites—from *ex*, out of; *sĕquor*, I follow: It. *esequie*]: the ceremonies or rites at a funeral—*obsequies* commoner. Exe'quial, a. *-ē'kwĭ-ăl*, pertaining to funeral rites.

EXERCISE, n. *ĕks'ėr-sīz* [F. *exercice*, an exercise—from L. *exercĭtĭŭm*, exercise—from L. *exercĕō*, I drive on or keep busy—from *ex*, out of; *arcĕō*, I shut up]: any labor or exertion of the body to promote health or for amusement; any exertion as in a profession, business, or employment; practice; application of the mind; a lesson or example for practice: V. to exert; to cause to act in any manner; to train by use; to discipline; to use exertion for amusement, health, or proficiency; to keep employed. Ex'ercising, imp. Ex'ercised, pp. *-sīzd*. Ex'ercisable, a. *-a-bl*, that may or can be exercised, used, employed, or exerted. Ex'erciser, n. one who. Exercitation, n. *ĕks-ėr'sĭ-tā'shŭn* [L. *exercĭtātĭōnem*]: practice—same as *exercise*.—*Exercise* is an indispensable element of health; to allow complete inaction of any part or function, is to initiate disease, probably even structural change, or atrophy. Hence the development of the muscular system, of the secretions, and even of the mind and its organ, the brain, require the more or less regular use of exercise, either in the form of productive and useful work, or by means of artificially devised methods calculated to serve a like purpose in regard to the economy: see Gymnastics. The best regulated life is that which secures due and proportionate exercise with intervals of due and proportionate rest, for all the functions, mental as well as bodily.

EXER'CITOR, n. [L.]: in *law*, the person to whom the profits of a ship belong, whether he be owner or hirer.

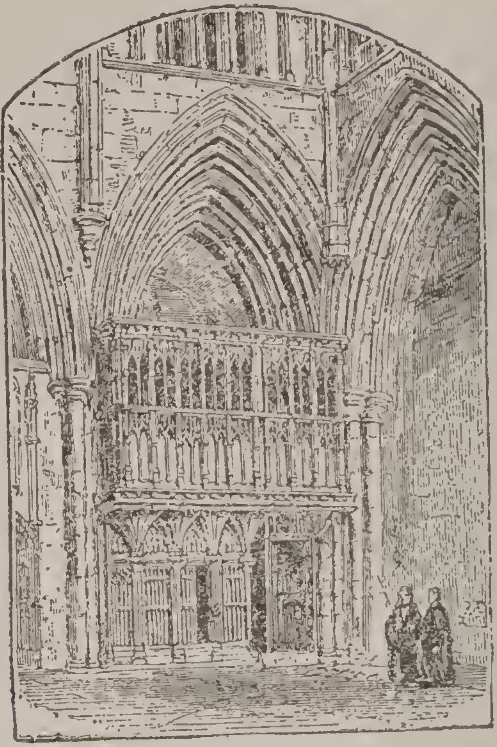
EXERGUE, n. *ĕks-ėrg'* [F. *exergue*—from Gr. *ex*, out of; *ergon*, work]: the small space on the face of a medal or coin left for a date, name, etc.—usually beneath the base-line of the subject engraved.

EXERT, v. *ĕgz-ėrt′* [L. *exsĕrtus*, thrust out, put forth—from *ex*, out of; *sĕrō*, I join or bind together]: to put into action, as strength, or the mind; to use with effort; to bring into active operation; to strive. EXERT′ING, imp. EXERT′ED, pp. EXER′TION, n. *-ėr′shŭn*, effort; the act of striving or straining.—SYN. of ‘exertion’: attempt; endeavor; trial; experiment; essay; struggle.

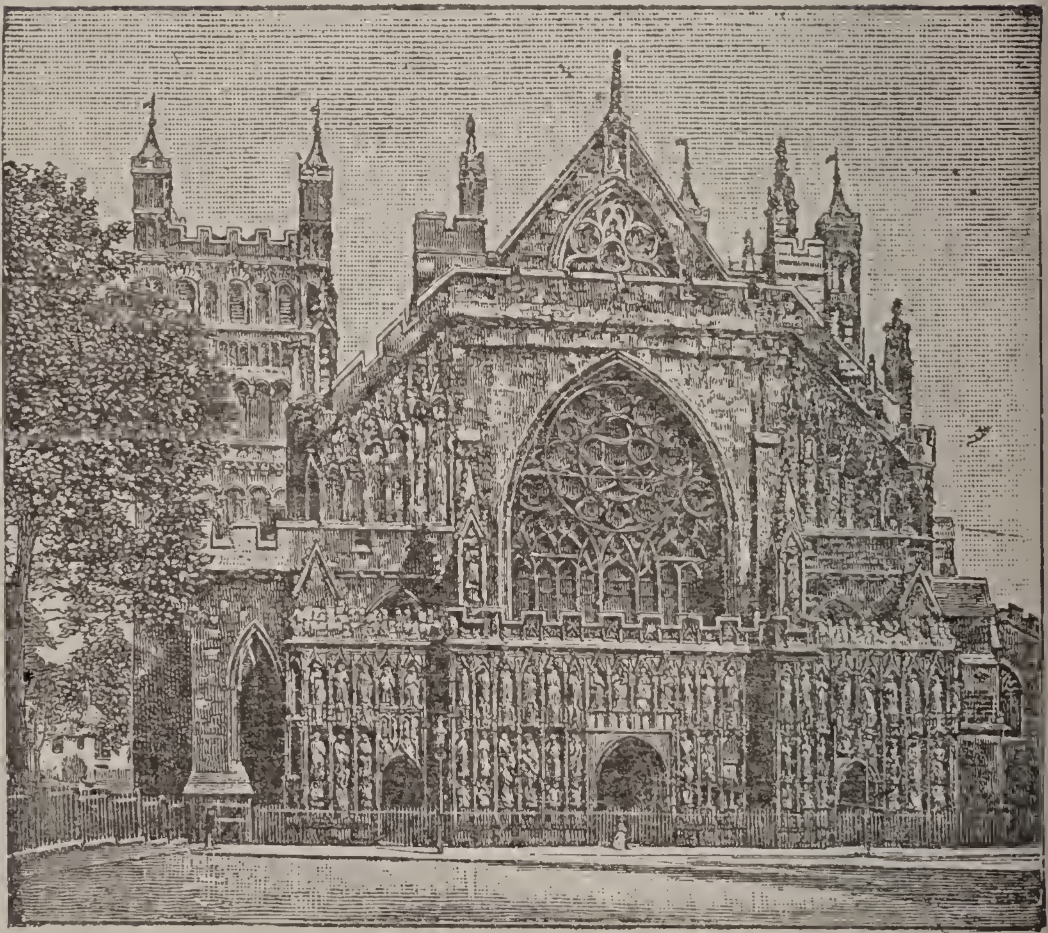
EXETER, *ĕks′ē-tėr:* town of Rockingham co., N. H.; on the E. river and the Boston and Maine railroad; 12 m. s.w. of Portsmouth, 17 m. s.s.w. of Dover, 51 m. n. by e. of Boston. E. is built around the falls on both banks of the river at the head of tide water; contains a court house in which sessions of the state and the United States circuit and dist. courts are held, 7 churches, public library, several schools, 1 national bank (cap. $100,000), and 2 savings banks, woolen mill, pottery, machine shop, cotton mill, 3 grist mills, and several carriage factories. It is noted chiefly as the seat of an acad. founded by John Phillips, LL.D., who bequeathed to it a large portion of his estate 1781 (see PHILLIPS EXETER ACAD.), and of the Robinson Female Seminary, organized 1869 with an endowment of $300,000. This ancient town is noted for culture and intelligence. E. was settled 1638, suffered by Indian wars 1690–1710, and was the cap. of the state during the revolutionary war.—Pop. (1880) tp. 3,569; (1890) 4,284; (1900) 4,922.

EXETER, *ĕks′ē-tėr* (the *Cær-Isc* of the Britons, the *Isca Damnoniorum* of the Romans, *Exancester* of the Saxons): city, episcopal see, separate county, parliamentary and municipal borough, and river-port, in the s.e. of Devonshire, and the cap. of that county. It is on an acclivity on the left bank of the Exe, 10 m. n.w. of its mouth, 170 m. w.s.w. of London, 73 m. s.w. of Bristol. It is on the whole well built and clean, and has two main lines of street meeting near the centre. There are some fine squares and terraces. The Guildhall has a singular portico, added 1593, and projecting into the street. It was restored, with considerable regard to artistic effect, 1864. In 1865 an elegant new post-office was erected; also a lunatic asylum, just outside the city. A quadrangle of almshouses, 45 in number, was completed 1866, with a church attached; and the Albert Memorial Museum was opened 1868. Exeter cathedral, magnificent in its ornamentation, was erected 1112–1478. It has Norman transeptual towers; but most of it is in the decorated style. The church was carefully restored 1870–77, by Sir Gilbert Scott. In one of its towers is the great Tom of Exeter or Peter's Bell, 12,500 lbs. weight, and a large curious antique clock. E. has a large floating ship-basin, 917 ft. long, 90 to 110 ft. broad, and 18 ft. deep; and a ship-canal, 15 ft. deep and 30 ft. broad. This canal extends 5 m., and terminates at Turf, about 2 m. from the head of the estuary of the Exe. E. has magnificent nurseries, and exports dairy, farm, and orchard produce from a neighborhood rich in such products. The town sends one member to parliament. E. was anciently the chief residence of the W. Saxon kings. Exeter bishopric, fixed here 1050 by Edward the Confessor, in-

PLATE 8.



Excubitorium or Watching-loft, St. Albans.



Exeter Cathedral—West Front

cludes Devon and Cornwall, 23 deaneries and 588 benefices. The city was formerly surrounded with walls and strongly fortified. On a height n. of E. are the ruins of Rougemont Castle, built by William I., on the site of one said to be as old as Cæsar's time. Many Roman and Greek coins have been found in E., besides tesselated pavements, fragments of columns, and small bronze statues.—Pop. of parliamentary borough (1881) 47,154; (1901) 46,940.

EX'ETER COL'LEGE, Oxford: founded 1314, by Walter de Stapledon, Bp. of Exeter, who removed from Hart Hall to the present site of E. C., a rector and twelve fellows. In 1404, Edmund Stafford, Bp. of Salisbury, added two fellowships, and gave the college its present name. Sir William Petre, 1565, founded eight more; and 1636, Charles I. annexed one more for the islands of Jersey and Guernsey. In 1770, Mrs Sheers left certain rents for the establishment of two fellowships. All these fellowships were originally appropriated to various archdeaconries or counties, especially in the west of England. A peculiarity in this college was, that the above foundations, though generally called fellowships, were, strictly speaking, only scholarships. Important changes were introduced under the authority of 17 and 18 Vict. c. 81. The number of fellowships was reduced to 15—all open without any restriction as to place of birth. The revenues of two fellowships were divided among the rectorship and the 15 fellowships. The remaining eight fellowships were devoted to the foundation of 22 scholarships; ten open without restriction; ten limited to persons born, or for three years educated in the diocese of Exeter; and two limited to persons born in any of the Channel Islands. Several exhibitions also are attached to the college; and there are about 16 benefices in the gift of the Society. The number of names on the books is about 750.

EX'ETER (or Exon) **DOMES'DAY**: see Domesday. **Exeter-elm**, n. in *bot. Ulmas Montana.* **Exeter-oak**, n. in *bot. Quercus cerris.*

EX'ETER HALL: large proprietory building, on the n. side of the Strand, London; 131 ft. long, 76 ft. wide, and 45 ft. high. It was completed 1831, and can contain more than 3,000 persons. It is let chiefly for religious assemblies, and is in great request during the 'May Meetings' of the several religious societies. It is also let as a concert-room, and has been the scene of many great musical fêtes.

EX FACIE, phrase, *ĕks fā'shĭ-ē* [L.]: from the face of; applied to what appears on the face of a document or writing.

EXFOLIATE, v. *ĕks-fō'lĭ-āt* [mid. L. *exfŏlĭātŭs*, stripped of leaves—from L. *ex*, out of; *fŏlĭŭm*, a leaf: F. *exfolier*]: to come off in scales; to scale off. **Exfo'liating**, imp. **Exfo'liated**, pp. **Exfo'lia'tion**, n. *-ā'shŭn* [F.—L.]: the process of separation in scales or splinters. **Exfo'liative**, a. *-ā-tĭv*, having the power of causing exfoliation.

EXHALE, v. *ĕgz-hāl'* [F. *exhaler*—from L. *exhālārĕ*, to breathe out—from *ex*, out of; *hālō*, I breathe: It. *esalare*]: to send out, as vapor or fume; to breathe out; to evaporate. Exha'ling, imp. Exhaled', pp. *-hāld'*. Exhalation, n. *ĕks'hă-lā'shŭn* [F.—L.]: the act or process of sending forth in fume or vapor—generally applied to what rises in the form of vapor from the earth; that which is emitted; effluvia. Exhalable, a. *ĕgz hā'lă-bl*, capable of being evaporated. Exhalant, a. *ĕgz-hā'lănt*, having the quality of evaporating or breathing out.

EXHAUST, v. *ĕgz-awst'* [L. *exhaustus*, emptied by drawing—from *ex*, out of; *haustus*, drained, emptied]: to empty by drawing out; to use and expend the whole; to fatigue very much. Exhaust'ing, imp.: Adj. wholly or partially depriving of a quality or power, as strength. Exhaust'ed, pp. Exhaust'er, n. one who. Exhaus'tible, a. *-tĭ-bl*, that may be exhausted. Exhaust'ion, n. *-hawst'yŭn* [F.—L.]: the act of drawing out or emptying; state of being emptied; state of being deprived of strength or spirits, in which the vital powers act feebly. Exhaus'tive, a. *-haws'tĭv*, tending to deprive of power, strength, or quality; that has treated the subject fully and from every point of view. Exhaust'less, a. that cannot be exhausted. Method of exhaustions, mode of proving mathematical propositions regarding quantities by continually taking away parts of them. The method was frequently employed by the ancient geometers; its fundamental maxim, as stated by Euclid, being that those quantities are equal whose difference is less than any assignable quantity. Euclid employs the method in Book x. Prop 1; and it was used by Archimedes to prove that the area of a circle is equal to that of a right-angled triangle whose one leg adjoining the right angle is the radius, and the other the circumference. In this ancient method is seen the rudimentary form of the modern transcendental analysis.—Syn. of 'exhaust': to drain; consume; spend; weary; tire out; empty; expend; wear out; excite.

EXHAUSTION OF SOILS: see Manure: Soils.

EX'HEDRA: same as Exedra.

EXHIBIT, v. *ĕgz-hĭb'ĭt* [L. *exhĭbĭtŭs*, shown or displayed—from *ex*, out of; *hăbĕō*, I have or hold: F. *exhiber*]: to present to view; to offer for inspection; to display; to show; to administer as a medicine: N. any paper formally exhibited in a court of law. Exhib'iting, imp. Exhib'ited, pp. Exhib'itant, n. *ant*, in *law*, one who makes an exhibit. Exhib'itor, n. *-ĭ tėr*. one who exhibits; also Exhib'iter, n. *-tėr*. Exhibition, n. *ĕks'hĭ-bĭsh'ŭn* [F.—L]: a showing or presenting for inspection; any public show; display; that part of the income of a school or college applied for the maintenance of scholars at English universities—in *Scot.*, called a *bursary;* an annual prize of money. Ex'hibi'tioner, n. a student who enjoys an exhibition. Exhibitive, a. *ĕgz-hĭb'ĭ-tĭv*, representative. Exhib'itively, ad. *-lĭ*. Exhib'itory, a. *-ĭ-tėr-ĭ*, showing; displaying. Exhib'it, n. any article displayed to view, as in a cattle-show or industrial exhibition; a law term, as in 'havers and exhibits,' signifying documents exhibited by a witness before a legal tribunal: see HAVERS. ART EXHIBITION: see ART EXHIBITION.

EXHIBITION, INDUSTRIAL [Fr. *Exposition de l'Industrie*]: displays, usually international, of the products of labor. The first was in France, 1798, at the suggestion of the Marquis d'Avèze. It was held in the Maison d'Orsay and its grounds; but it appears to have been rather a collection of such objects of French art-manufacture as could be borrowed from their owners, than an assembling together of competing artists and manufacturers with their respective works. In the same year, another exhibition was held in Paris, on a grander scale, and with considerable success. It embraced all kinds of manufactures; hence has been claimed, but not justly, as the first of industrial exhibitions. Another was held 1802, under the consulate of Napoleon; and these successes led to the establishment of triennial exhibitions.

In Britain, 1850, the Prince Consort originated the plan of holding a universal exhibition open to all comers. Previously, however, the Royal Dublin Soc., since 1829, had had triennial exhibitions of native industry.

In England, the first well-organized exhibitions were those of the Cornish Polytechnic Soc., illustrating the mineral wealth of the county, and its mechanical appliances for mining. These were annual until 1850. Manchester, Birmingham, and Liverpool also held local exhibitions; that of Birmingham, 1849, far the most important, was the prototype of the 1851 exhibition.

For the great Exhibition in London, 1851, proposed by Prince Albert, the subscription list to a guarantee-fund was opened by the queen with £1,000. The exhibition took place in a vast structure of iron and glass, called the Crystal Palace, in Hyde Park, London. The edifice, planned by Sir Joseph Paxton (q.v.), was opened by her majesty, 1851, May 1. It was 1851 ft. long by 456 ft. broad. and 66 ft. high; area 13 acres. On the ground floor and galleries were 8 m. of tables. The glass in the structure weighed more than 400 tons. The number of exhibitors exceeded 17,000. The exhibition was open 144 days, closed Oct. 11. The entire number of visitors was 6,170,000, averaging 43,536 per day. The largest number at one time in the building was 109,760, Oct. 8. The entire money drawn for tickets of admission amounted to £505,107; and after all expenses were defrayed, a balance of £150,000 was left over; so that there was no call on those who subscribed the guarantee fund. Popularly, this great exhibition was called the World's Fair, for it drew visitors from all parts of the world. When the exhibition was over, the building was cleared away. In 1852, an exhibition (domestic) was held in Cork, Ireland; in 1853, one in Dublin (international) including a fine gallery of pictures; in the same year, one in New York (international) in a building of glass and iron called the Crystal Palace, on Reservoir Square, Sixth Ave. and 42d St. France, 1855, repeated the experiment with immense success; both the industrial and the art collections were such as the world had never seen before Though wanting the imposing magnitude of the Hyde Park building, the contents of the Palais de l'Industrie, with its detached Picture-gallery and its Annèxe, were of the choicest description, and reflected the highest credit on French taste and skill. Several other continental nations followed with various success, and now every country looks upon an exhibition of its industrial resources and productions, from time to time, as a grand necessity. In 1861, there was an exhibition at Haarlem, in which a vast assemblage of admirably arranged specimens illustrated every industry followed by the most industrious and methodical people of Europe.

Among the more important international exhibitions held since the Centennial Exhibition (q.v.) in Philadelphia 1876, are those at Paris 1878; Berlin and Sydney 1879; Melbourne 1880; Berlin, Moscow, and Buenos Ayres 1882; Louisville, Caracas, Amsterdam, and Chicago (railroad appliances) 1883; Calcutta and New Orleans (cotton) 1884; Antwerp 1885; Edinburgh and Liverpool (shipping) 1886; Manchester 1887; Melbourne (centennial), Glasgow, and Brussels 1888; Boston (maritime) and Paris 1889; and in London (electrical) 1882, (fisheries) 1883, (health) 1884, (inventions) 1885, (colonial) 1886, (American) 1887, (Italian, Irish, and Anglo-Danish) 1888, and (Spanish) 1889. As completing a series of commemorations of the 400th anniversary of the discovery of America by Columbus, the Columbian World's Exposition (q.v.) under the auspices of the U. S. govt. was held at the city of Chicago on a scale of unprecedented grandeur.

The universal exhibition at Paris 1889, commemorating the centennial of the fall of the Bastile, excelled all its predecessors in magnitude and comprehensiveness. It was organized and conducted conjointly by the govt., the city of Paris, and an association of guarantors, the govt. agreeing to advance $3,400,000, the city $1,600,000, and the association $3,600,000, total $8,600,000. Of this total, $6,330,000 were apportioned for the erection of the various buildings, and for improving the parks, gardens, etc., $670,000 for the expenses of administration, and $1,000,000 for working expenses, $600,000 being set aside for use in case of emergency. With the included grounds, the exhibition occupied 173 acres. The Eiffel Tower (q.v.) was one of the principal attractions, and as a marvel of constructive skill was rivalled by the Machinery Palace, which had a span of 377 ft., and was without pillars or other similar support. The exhibition was opened May 5 and closed November 6, and during this period 28,000,000 persons passed its turnstiles, 111,000 on the opening day, 500,000 on the closing. The following estimates were made of visitors from various countries: Great Britain 600,000; United States and Canada 125,000; Belgium 118,649; Germany, 27,516; Holland 11,365; Russia 2,006; and so on down to Oceanica, credited with 500. The total receipts were $9,800,000 and expenditures $8,200,000. The octroi of Paris received

January—October 28 an increase of $1,800,000 in duties collected over the like period 1888. and the city. of Paris received $540,000 from the profits of the exhibition; 60,000 persons exhibited wares of some kind; 32,468 of them were rewarded by the juries as follows: grand prize 903, gold medal 5,153, silver medal 9,690, bronze medal 9,325, and honorable mention 8,070. The share of the United States in the exhibition was unsatisfactory alike to its citizens and those of other countries. Congress appropriated only $250,000 to its commissioners and the U. S. exhibits occupied the fourth rank in size. But in one respect the United States surpassed all other nations: its electrical display was exceeded in popular interest only by the Eiffel Tower. The site of the exhibition was, as in 1867, the Champ de Mars, to which was added the Esplanade des Invalides. The Pont d'Iena connected the Champ de Mars with the grounds of the Tròcadéro Palace, and was doubled in width for the occasion. Looking from this bridge toward the Ecole Militaire, the eye was attracted first by the row of 39 buildings designed and erected by Charles Garnier, the architect and archæologist, to reproduce the typical homes of the human race in all the past ages. Immediately beyond this group was the Eiffel Tower, surrounded by small ornamental lakes and specimens of the architecture of various S. American republics. The exhibition was a large financial success.

EXHILARATE, v. *ĕgz-hĭl'er-āt* [L. *exhĭlărātus*, gladdened greatly—from *ex*, out of; *hilărātus*, cheered]: to cheer; to gladden; to make cheerful; to enliven; to become joyous. Exhil'arating, imp.: Adj. having the power or tendency to exhilarate. Exhil'arated, pp. Exhil'ara'tion, n. *-ā'shūn*, joyousness, gayety; the act of making glad or cheerful. Exhil'ara'tingly, ad. *-lĭ*. Exhil'arant, a. exciting joy. mirth or pleasure: N. that which exhilarates.—Syn. of 'exhilarate'· to animate; encourage; enliven: comfort; console; solace;—of 'exhilaration': animation; gladness; joyfulness.

EXHORT, v. *ĕgz-hŏrt'* [F. *exhorter*—from L. *exhortor*, I encourage—from *ex*, out of; *hortor*, I advise, I instigate]: to advise; to warn or caution; to animate or incite by words. Exhort'ing, imp. Exhort'ed, pp. Exhortation, n. *ĕkz'hŏr-tā'shŭn* [F.—L.]: the act of exhorting; incitement to laudable deeds; formal advice; counsel. Exhor'tative, a. *ĕgz-hŏr'tă-tĭv*, containing exhortation. Exhor'tatory, a. *-tėr-ĭ*, tending to exhort. Exhor'ter, n. one who.

EXHUME, v. *ĕks-hūm'* [F. *exhumer*, to unbury—from mid. L. *exhŭmārĕ*—from L. *ex*, out of; *humus*, the ground]: to dig up what has been buried; to disinter. Exhu'ming, imp. Exhumed', pp. *-hūmd'*. Ex'huma'tion, n. *-hū-mā'shŭn* [F.—L.]: the act of disinterring; the digging up of anything buried.

EXIGENT, a. *ĕks'ĭ-jĕnt* [L. *exigens* or *exigen'tem*, driving or thrusting out—from *ex*, out of; *agens*, doing or driving]: pressing; urgent; requiring immediate aid or action.

Ex'igence, n. *-jĕns*, or Ex'igency, n. *-jĕn-sĭ*, urgent need or want; pressing necessity. Ex'igible, a. *-jĭ-bl*, capable of being demanded.—Syn. of 'exigency': emergency; crisis; conjuncture; demand; urgency; pressure; distress; necessity.

EXIGUITY, n. *ĕks'ĭ gū'ĭ-tĭ* [F. *exiguité*, scantiness—from *exigu*, scanty—from L. *exĭgŭŭs*, scanty, small]: smallness; slenderness. Exig'uous, a. *-ū-ŭs*, small; scanty.

EXILE, n. *ĕgz'īl* or *ĕks'īl* [F. *exil*, banishment; *exile*, the person banished—from L. *exsĭlĭŭm*, banishment—from *exsul*, an exile]: the state of being expelled from one's native country; banishment, sometimes voluntary; the person expelled from his native country; one who leaves his own to reside in another country; one separated from friends or country by necessity: V. to drive away or banish from one's native country by misfortune or necessity. Exi'ling, imp. Exiled, pp. *ĕgz'īld* or *ĕg-zīld'*. Exilic, a. *ĕgs'ĭl-ĭk*, relating to or connected with exile or banishment: *specifically*, relating to the captivity of the Hebrews in Babylon.—Syn. of 'exile, v.': to banish; expel; transport; proscribe; drive away.

EXILITY, n. *ĕks-ĭl'ĭ-tĭ* [L. *exīlĭs*, thin, slender]: slenderness; smallness.

EXINANITION, n. *ĕks'ĭn ă-nĭsh'ŭn* [L. *ex*, out of, *inānis*, empty, void]: in *OE.*, emptiness; loss; privation.

EXINDUSIATE, a. *ĕks-ĭn-dū'zĭ-āt:* in *bot.*, not having an indusium; used chiefly of ferns.

EXINTINE, n. *ĕgz ĭn'tīn* [L. *ex*, from; *intus*, within]: in *bot.*, one of the inner coverings of the pollen-grain: see Extine.

EXIST, v. *ĕgz-ĭst'* [F. *exister*, to exist—from L. *existĕrĕ:* L. *existens*, being visible, existing: It. *existere*]: to be; to have an essence or real being; to live; to endure. Exis'ting, imp.: Adj. having being or life; actual. Exis'ted, pp. Exis'tence, n. *-ĭs tĕns* [F.—L.]: real being or essence; life; animation. Exis'tent, a. having being.—Syn. of 'exist': to subsist; occur; continue.

EXIT, n. *ĕks'ĭt* [L. *exit*, he goes out—from *exīrĕ*, to go out—from *ex*, *īrĕ*, to go]: the departure of a player from the stage; a word placed on the margin of a play to indicate the same; the act of quitting the stage of life; death; a departure; a passage out of any place; a way. Exitus, n. *-tŭs*, in *law*, issue, offspring; yearly rents or profits of land. Ex'eunt, plu. *-ĕ-ŭnt* [L.]; they go out. Ex'eunt omnes, *ŏm'nēz* [L. *exĕŭnt*, they go out; *omnēs*, all]: they all go out.

EXITELE: same as Exitelite.

EXITELITE, n *ĕks'ĭ-tĕl īt* [F. *exitèle*—from Gr. *exitēlos*, going out, disappearing, fading]: in *mineral.*, the same as Valentinite (q.v.).

EX LEGE, phrase, *ĕks lē'jē* [L. out of the law]: arising from law.

EX MERO MOTU, phrase, *ĕks mĕr'ō mō'tū* [L.]: of one's own motion.

EXMOOR FOREST. *ĕks'mōr:* moory, mostly uncultivated waste, consisting of dark ranges of hills and lonely valleys, 14 sq. m. in area, in the w. of Somersetshire and n.e. of Devonshire. It is bordered by deep wooded glens. The hills rise in Dunkery Beacon to 1,668 ft., in Chapman Barrow to 1,540, and in Span Head to 1,510. Devonian slates, with some new red sandstone in the n. form the substratum It is covered with heath, interspersed with juniper, cranberry, and whortleberry, with much meadowland. Throughout this tract there is a native breed of ponies, known as Exmoor ponies, reputed stout and hardy. Since 1851, E. has become an iron-mining district. The river Exe, and its tributary the Barle, rise in Exmoor. The region is subject to winds and mists.

EXMOUTH, *ĕks'mŭth:* town in the e. of Devonshire, on the left bank of the mouth of the Exe, 10 m. s.e. of Exeter; at the base and on the slope and top of a hill rising from the sandy estuary of the Exe. It is noted for its mild climate. From about 1700, it was the chief watering-place on the Devon coast, till the rise of Torquay. There is a fine promenade on a sea-wall 18 ft. high. The Woodbury Hills on the e. 800 ft. high, protect it from the e. winds. Here Sueno the Dane landed 1003. It was taken by the royalists 1646.—Pop. (1871) 5,614; (1881) 6,245; (1891) 8,097.

EXMOUTH, *ĕks'mŭth*, EDWARD PELLEW, Viscount: 1757, Apr. 19—1833, Jan 23; b. Dover, England: naval commander. He entered the British navy when 13 years of age, and first attracted notice by his gallant conduct in the battle on Lake Champlain, 1776, Oct. 11. In 1782, he attained the rank of post-captain. In 1793, in command of the *Nymphe*, frigate of 36 guns, he captured *La Cleopatre*, French frigate, which carried the same number of guns. For this victory he was knighted. In 1799, he received the command of the *Impétueux*, 78 guns, and was sent to the French coast, where many of his most brilliant actions took place. In 1804, Sir E. Pellew was advanced to the rank of rear-admiral of the red; in 1808, to that of vice-admiral of the blue; and in 1814, he was raised to the peerage, with the title of Baron Exmouth of Canonteign, Devonshire, with a pension of £2,000 a year. In 1816, he was sent to Algiers, to enforce the terms of a treaty regarding the abolition of Christian slavery, which the dey of Algiers had violated. With a combined fleet of 25 English and Dutch vessels, he bombarded the city for seven hours, and inflicted such immense damage, destroying all the Algerine fleet and many of the public buildings, that the dey consented to every demand. E., who had been wounded in the leg and cheek in this action, received on his return to England the thanks of both houses of parliament, and was promoted to the rank of viscount, 1816, Dec. 10. In 1821, he retired from public service, loaded with honors.

EX NECESSITATE, phrase, *ĕks nĕ-sĕs-ĭ-tā'tē* [L.]: of or from necessity; from the necessity of the case.

EXO, *ĕks'ō* or *ĕgz'ō* [Gr.]: a Greek prefix, signifying 'on the outside.'

EXOCCIPITAL, n. *ĕks-ŏk-sĭp'ĭ-tal* [L. *ex*, out; Eng. *occipital*]: in *anat.*, condyloid portions of the occipital bone; in *comp. anat.*, the lateral parts of the first cranial segment, corresponding with the order of the *foramen magnum* in man.

EXOCŒTUS, n. *ĕks-ō-sē'tŭs* [L. *exocœtus;* Gr. *exōkoitos*; as adj., sleeping out; as n. a fish that comes upon the beach to sleep; *exō*, without; *koitos*, a bed, sleep]: in *ich.*, genus of *Scomberesocidæ;* the body is moderately compressed, with large pectoral fins, the rays of which are stout and firm; the arm-bone or radius of this fin also is large. *Exocœtus exiliens* is the Greater Flying-fish.

EXOCULATION, n. *ĕks-ŏk-ū-lā'shŭn* [L. *ex*, out of; *oculus*, an eye]: the act of putting out an eye.

EXOCE'TUS: see FLYING-FISH.

EXODIC, a. *ĕks-ŏd'ĭk:* in *phys.*, conducting influence from the spinal marrow. Used specially of the motor nerves.

EXODIUM, n. *ĕks-ō'dĭ-ŭm* [L.—from Gr. *exodion*]: afterpiece in a theatre, usually played after tragedies; a farce.

EXODUS, n. *ĕks'ō-dŭs* [Gr. *ex*, out of; *hodos*, a way]: the second book of the Old Testament; departure of the Israelites from Egypt; a departure from a place.—Exodus, the second book of the Pentateuch, may be regarded as composed of two parts—the first historical, and the second legislative. The historical part extends to the end of ch. xviii. It embraces a narrative of the various preparations, natural and supernatural, under the providence of God for the deliverance of the Israelites from their bondage in Egypt, and describes the accomplishment of their deliverance, and the journeyings of the people in the wilderness as far as Mount Sinai. The legislative part is devoted to a minute and elaborate account of the institution of the theocracy. The book presents three aspects of Hebrew history. We have, first, a picture of a people enslaved; second, of a people redeemed from bondage; and third, of a people sanctified and set apart to the service of God. The period embraced by the history of the book is usually reckoned at 142 or 145 years, which number is obtained as follows: From the death of Joseph to the birth of Moses, 60 or 63 years; from the birth of Moses to the departure from Egypt, 80 years; and from the departure out of Egypt to the erection of the tabernacle, 1 year. It cannot be denied, however, without wildly violating all the ordinary laws of the increase of population, that this is much too short a period to account for the existence of such a number of Hebrews as left Egypt—viz., 600,000, exclusive of women and children—i.e., in all, at least 2,500,000. Those who went down into Egypt with Jacob were 'threescore and ten souls,' and in 215 years, these, though prohibited from intermarrying with the Egyptians, had amounted to between two and three millions. The writer of Exodus, indeed, says (chapter xii., verse 40) that 'the sojourning of the children of Israel, who dwelt in Egypt, was 430 years,' adding that they left the land 'even the selfsame day' on which they had entered it. This statement, however, does not seem to harmonize with the author's previous narrative, and is certainly inconsistent with the language of the apostle Paul, who says (Gal. iii. 17) that the law was given 430 years after the covenant with Abraham, which took place about 215 years before Jacob and his sons went down into Egypt, so that, according to this view, the Israelites could only have been in Egypt 215 years. This is the number commonly accepted; but it is not wonderful that some writers should affirm, that 'it would be more satisfactory if we could allow 430 years for the increase of the nation in Egypt rather than any shorter period.' A still longer period would undoubtedly afford additional satisfaction; and Bunsen, in his *Ægypten's Stelle in der Weltgeschichte*, endeavors to show that the Israelites were in Egypt for *fourteen* centuries instead of two, and that the number 215 only indicates the period of oppression, the time when they were 'evilly entreated.' This conclusion is, of course, arrived at by the application of principles of criticism not generally recognized in the schools of British theology: but there seems no avoiding the conclusion, that the usual chronology is wrong.

May it not be that the interval which elapsed between the death of 'Joseph and all his brethren, and all that generation' (Ex. i. 6), and the period when there arose up a new king over Egypt which knew not Joseph (Ex. i. 8), was much longer than we suppose? The passage itself in Exodus seems to favor this idea; for the intervening verse (Ex. i. 7) speaks of the children of Israel 'increasing and multiplying, and waxing exceeding mighty, and filling the land,' without any reference at all to the time occupied in this process; and such words are certainly more applicable to a series of centuries than of years, while centuries, besides, would harmonize better than years with the statement that the Egyptian king knew not (i. e., had forgotten all about) Joseph. The only grave objection to this otherwise extremely probable hypothesis, is its incompatibility with the statement of St. Paul; and perhaps, as in a like case, Luther said of the inspired Stephen, 'he was no historian, and did not trouble himself about particulars.'

In explanation of the chronological diffculty, the confusion resulting from the use of *letters* as numerals in Hebrew MSS. has been urged; and this is notoriously a fertile source of error and contradiction, which rationalistic critics have not sufficiently kept in mind. To adduce such a reason, however, would be unavailing in the present case; for if it could be proved that the period stated in Exodus may have been abbreviated through the negligence of some careless transcriber, or otherwise, and thus an approximation be made to the *fourteen* centuries of Bunsen, this would only place the writer of the Pentateuch in more visible antagonism with St. Paul himself. The date of the exodus is fixed by Usher at B.C. 1491: by the Septuagint, at B.C. 1614; by Hales, at B.C. 1648; by Wilkinson, about B.C. 1495, in the reign of Thothmes III.; and by Bunsen, as late as B.C. 1320 or 1314, in the reign of Menephthah, in the latter of which years Manetho gives what appears to be the Egyptian version of the event. The genuineness and authenticity of the book of E. have been sharply criticised in modern times. The chronology is confused; but recent investigations indicate, as the probable date of the Exodus from Egypt, B.C. 1317, Apr. 15. Among the theologians who have questioned the integrity of E. are Von Lengerke, Stähelin, De Wette, Knobel, and Colenso, who find traces of an older and a later author, the former of whom they call Elohistic, and the latter Jehovistic. Their objections have been replied to by Hengstenberg and many others, who contend that the distinction is either artificial, or incapable of precise application. See PENTATEUCH: MOSES: JEWS.

EX OFFICIO: see under EX.

EXOGAMY, n. *ĕks ŏg'ă-mĭ* [Gr. *exō,* without; *gamos,* marriage]: the practice among certain savage peoples of always marrying out of the tribe (see TRIBE). EXOGAMOUS, a. *ĕks-ŏg'ă-mŭs,* pertaining to a tribal law among savages of always marrying from another tribe.

EXOGASTRITIS, n. *ĕks-ō-găs trī'tĭs* [prefix *exo-;* Eng. *gastritis*]: in *pathol.*, inflammation of the external membrane of the stomach.

EXOGEN, n. *ĕks'ō-jĕn,* EX'OGENS, n. plu. *-jĕns* [Gr. *exo,* without; *gennăō,* I produce]: that division of the vegetable kingdom in which the plants grow by additions to the outside of the wood in the form of annual concentric layers, as in the oak, ash, elm, and other dicotyledons—distinguished from the *endogens,* those plants whose growth is from within outward. EXOGENOUS, a. *-ĕ-nŭs,* growing or increasing in size by annual additions to the outside, as in the oak, ash, etc.; in *anat.*, growing out from a bone already formed.—*Exogenous plants* are those in which the woody substance of stem increases by bundles of vascular tissue added externally. The exogenous stem contains a central *Pith* (q.v.), from which *medullary rays* proceed to the Bark (q.v.) and the bark is easily separable from the woody part (see WOOD) which it surrounds. The exogenous is thus very different in structure and manner of growth from the endogenous or the acrogenous stem. Amid the cellular substance of the young stem, when it has developed itself from the seed, woody cords are seen connecting the cotyledons, and afterward the leaves, when these appear, with the root, in the central axis of which they join. A section of the stem exhibits the cellular substance traversed by vascular bundles (wood and bast), which in the section are more or less wedge-shaped, radiating from the centre, but not prolonged into the centre itself, which, even to the greatest age of the stem, remains occupied by the cellular pith. Additional bundles are interposed, as growth proceeds, diminishing the proportion of cellular substance in the stem, yet without these bundles ever becoming so compacted together as to cut off the communication between the cellular centre of the stem and its bark, which is maintained by means of the medullary rays, often, indeed, imperceptible to the naked eye, but always present even in the hardest and most close-grained wood. The woody layers which are formed in successive years, as new leaves and branches are developed, are formed amid the *Cambium* (q.v.), into which the woody fibres of the new leaves descend, between the bark and the former wood. Thus the concentric circles are formed, usually one for each year's growth, distinguishable even in the most matured timber, and by which the age of trees is commonly computed. The beginning of each new layer is generally marked by a greater abundance of *pitted vessels,* the openings of which are conspicuous in the transverse section. In pines, the line of separation between the layers is marked by greater density of texture, and often by deeper color. The age of trees cannot, however, be calculated with perfect certainty from the concentric circles of the stem, as any circumstance which temporarily arrests the growth in any summer, may produce an effect similar to that ordinarily produced by the change of seasons; while in the trees of tropical countries, at least where the wet and dry seasons are not very marked, concentric circles are often not to be discovered.

The structure of the branch of an exogenous tree perfectly corresponds with that of the stem. The vascular bundles of the stem or branch form a loop where a leaf begins, and those of the leaf and its axillary bud spring from the loop. The roots of the exogenous plants have not a central pith like the stem, but in a few trees, as the horse-chestnut the pith is prolonged to some extent into the root.

Anomalies are frequently seen in the structure of exogenous stems, particularly among the twining woody plants of tropical countries. There are also very many herbaceous plants, in which, though the structure agrees with that of an exogenous tree in its first year, no further development is ever attained; while in many, even this is very imperfectly reached; yet these are on other accounts unhesitatingly classed with exogenous plants. The exogenous stem and dicotyledonous seed are so constantly found together; and the term *exogenous,* designating a great division of the vegetable kingdom, is now giving place to the term dicotyledonous (q.v.): see BOTANY. Exogenous plants are also characterized by a particular mode of germination, with reference to which they are called *exorhizal* [Gr. *exō,* outward; *rhiza,* a root], the radical simply lengthening, and not having to break through the coat of the embryo. The leaves of exogenous plants generally exhibit a network of veins, instead of the parallel veins characteristic of endogens, and a greater proportional breadth of leaf usually accompanies this reticulated venation.

Exogenous plants are far more numerous than endogens. The trees and shrubs of temperate and cold climates generally, are exogenous, as well as very many herbaceous plants of these parts of the world, and many trees, shrubs, and herbaceous plants of the tropics. Almost all trees, except palms and a few *Liliaceæ*, *Pandanaceæ*, and tree-ferns, are exogenous.

EXOGONIUM, n. *ĕks-o-gō'nĭ-ŭm* [Gr. *exo*, outside; *gonē*, that which engenders, because the stamens are exsected]: genus of *Convolvulaceæ*, tribe *Convolvuleæ*. *Exogonium Purga*, a beautiful twiner, with long purple flowers, furnishes the best jalap.

EXOGYRA, n. *ĕks-o-jīr'a* [Gr. *exō*, outside; *guros*, a ring, a circle: so named because the beaks are reversed, that is, turned to the posterior side of the shell]: in *paleon.*, subgenus of *Gryphæa*. Known species 46, ranging from the Oolite to the Chalk. They are found in the rocks of the United States and Europe.

EXOMPHALOS, n. *ĕks-ŏm'fă-lŏs* [Gr. *exō*, without; *omphălos*, a navel]: umbilical hernia; the protrusion of the intestine through the umbilicus.

EXON, n. *ĕks'ŏn:* an officer of the yeomen of the royal guard in England. Exonship, n. *-ship*, the office or post of an exon of the royal body-guard. Exon-in-waiting, an officer of the royal guard in special attendance on the court.

EXON, a : pertaining to Exeter cathedral or city.

EXONERATE, v. *ĕgz-ŏn'ėr-āt* [L. *exŏnĕrātus*, freed from a burden—from *ex*, out of; *onĕrātus*, loaded; *onus*, a load: It. *esonerare:* F. *exonérer*]: to free from; to clear from blame; to cast off, as an obligation or charge on any one; to exculpate; to absolve. Exon'erating, imp. Exon'erated, pp. Exon'era'tion, n. *-ā'shŭn*, the act of freeing from a charge or from blame. Exonerator, n. *-tėr*, one who exonerates another. Exon'erative, a. *-tĭv*, freeing from an obligation or from blame.—Syn. of 'exonerate': to acquit; clear; justify; discharge; unload; disburden; relieve.

EXOPHAGY, n. *ĕks-ŏf'a-jĭ* [Gr. *exō*, without, externally; *phagein*, to eat]: kind of cannibalism in which only persons of a different tribe are eaten. Exoph'agous, a. *-gŭs*, practicing exophagy.

EXOPHLÆUM, n *ĕks-o-flē'ŭm* [Gr. *exō*, outside; *phloios*, rind or bark of trees]: in *bot.*, same as Epiphlœum.

EXOPHTHALMOS, n. *ĕks'ŏf thăl'mŏs*, or Ex'ophthal'mia, n. *-thăl'mĭ-ă* [Gr. *exō*, without, outside; *ophthal'mos*, the eye]: great prominence of the eyes, in which the individual has a marked and peculiar stare. Ex'ophthal'mic, a. *-thăl'mĭk*, of or pertaining to exophthalmia. Exophthalmic-goitre, n. in *med.*, an indolent tumor on the fore part of the neck, caused by enlargement of the thyroid gland, and attended by protrusion of the eyeballs, anæmia, and palpitation.

EXOPHYLLOUS, a. *ĕks-ŏf'ĭl-ŭs* [Gr. *exō*, outside; *phullon*, a leaf]: not evolved from a sheath, but outside all such protection; used of dicotyledons as distinguished from monocotyledons, the leaves of which are evolved from a sheath.

EXOPODITE, n. *ĕks-ŏp'ō-dīt* [Gr. *exō*, outside; *pous* or *poda*, a foot]: in *zool.*, the outer of the two secondary joints into which the typical limb of a crustacean is divided.

EXOPTILES, n. *ĕks-ŏp'tīl* [Gr *exō*, outside; *ptilon*, feather, leaf, because the plumula is naked]: in *bot.*, name given by Lestibondois to *Dicotyledons*.

EXORBITANT, a. *ĕgz-ŏr'bĭ-tănt* [F. *exorbitant*, exorbitant—from mid. L. *exorbĭtăn'tem*—from L. *ex*, out of; *orbĭtă*, the track of a wheel, the impression of anything—from *orbis*, an orb or sphere]: deviating from the usual course; unreasonable; enormous; excessive. Exor'bitance, n. *-tăns*, or Exor'bitancy, n. *-tăn-sĭ*, a going beyond due limits; enormity; excessive extravagance. Exor'bitantly, ad. *-lĭ*.

EXORCISE, v. *ĕks'ŏr-sīz* [F. *exorciser*—from mid L. *exŏrcīzārĕ*—from Gr. *exŏrkīzein*, to cause to swear, to conjure—from *ex*, intensive; *orkizein*, to bind by oath—from *orkos*, an oath]: to expel evil spirits by prayers and ceremonies, or by conjurations; to deliver from evil spirits; to adjure by a holy name. Ex'orcising, imp. Ex'orcised, pp. *-sīzd*. Ex'orciser, n. *-sī-zėr*, one who pretends to be able to cast out evil spirits. Ex'orcist, n. *-sĭst*, one who. Ex'orcism, n. *-sĭzm*, the act of exorcising; conjuration in the name of the heavenly powers; term used by the Fathers of the church to denote the act of conjuring evil spirits, in the name of God or Christ, to depart out of the person possessed. The first Christians adjured evil spirits in the name of Jesus Christ, who had conquered the devil; but as the opinion was at the same time entertained, that all idolaters belonged to the kingdom of Satan—who suffered himself to be worshipped under the form of idols—it was customary to exorcise heathens previous to their receiving Christian baptism. After Augustine's theory of original sin had found acceptance in the 5th c., and all infants were regarded as belonging to Satan's kingdom, exorcism became general at the baptism even of Christian children. Following the practice of the Rom. Cath. Church, Luther retained exorcism, but it was laid aside by the Reformed Church. Although abandoned by illustrious and orthodox Prot. theologians, such as Chemnitz and Gerhard, or deemed unessential, and in modern times discarded by the 'Protestant' Church, the practice has been recently revived by the Old Lutheran or High-Church party.

In the Rom. Cath. Church, the function of exorcism belongs peculiarly to one of the so-called 'minor orders': see Orders. Our Lord having not only himself in person (Matt. ix. 32; Mk. i. 25; Lk. iv. 35; viii. 29) cast out devils, but having also given the same power to his disciples, it is believed to be permanent in the church. Of its exercise in the early church, both in relation to 'energumens,' or persons possessed, and in the administration of baptism, there are numerous examples. Tertullian and Origen speak of it as of ordinary occurrence, and the council of Carthage, 255, alludes to its use in baptism. The rite of exorcism is used by the modern church in three different cases: in the case of actual or supposed demoniacal possession in the administration of baptism, and in the blessing of the chrism or holy oil, and of holy water. Its use in cases of possession is now extremely rare, and in many diseases is prohibited, unless with the special permission of the bishop. In baptism it precedes the ceremony of applying the water and the baptismal form. It is used equally in infant and in adult baptism, and Rom. Cath. writers appeal to the earliest examples of the administration of the ordinance as evidence of the use of exorcism in both alike. The rite of baptismal exorcism in the Rom. Cath. Church follows closely the Scriptural model, Mk. viii. 33 The exorcisms in the blessing of the oil and water resemble very closely the baptismal form, but are more diffuse.

EXORDIUM, n. *ĕgz-ŏr'dĭ-ŭm* [L. *exordĭŭm*, the warp of a web, a beginning—from *ex, ordĭŏr*, I begin a web, I begin: It. *esordio:* F. *exorde*]: the introductory part of a discourse, or of a written composition; the opening part of an oration or speech. Exor'dial, a. *-ăl*, introductory.

EXORHIZAL, a. *ĕks'ō-rī'zăl* [Gr. *exō*, outside; *rhiza*, a root]: in *bot.*, applied to those plants whose roots in germination proceed at once from the radicular extremity of the embryo, and do not burst through an outer coat. Exorhi'zæ, n. *-zē*, in *bot.*, name given by Richard to what are commonly called Exogens. The term is used because in germination the radicles have no sheaths at their base, but appear at once Richard termed them also *Synorhizeæ*. Exorhizous, same as Exorhizal.

EXOSKELETON, n. *ĕks'ō-skĕl'ĕ-tŏn* [Gr. *exō*, outside; *skĕlĕton*, a dry body or mummy]: in *anat.*, the hardened superficial tissues of external protection, as the crusts of crabs, the plates of reptiles, and the scales of fishes.

EXOSMOSE, n. *ĕks'ŏs-mōs* [Gr. *exō*, outside; *ōsmos*, a thrusting, an impulsion: F. *exosmose*]: the passing outward of a fluid through a membrane by diffusion—the passing inward from the outside is called *endosmose* (q.v.). Ex'osmot'ic, a. *-mŏt'ĭk*, pertaining to. Exos'mic, a. *-mĭk*, same as Exosmotic.

EXOSPORE, n. *ĕks'ō-spōr* [Gr. *exō*, without; *spora*, a seed]: the outer covering or wall of a spore; that which may be compared to the extine of a pollen-grain. Exosporous, a. *ĕks ŏs'pō-rŭs*, having naked spores as in fungi.

EXOSSATE, a. *ĕks-ŏs'sāt*, or Exos'sated, a. *-ĕd* [L. *exossatus*]: deprived of bones.

EXOSTEMMA, *ĕks-o-stĕm'ma:* genus of American trees and shrubs of the nat. ord. *Cinchonaceæ*, nearly allied to *Cinchona*. Several species yield febrifugal barks, which, however, do not contain the chincona alkaloids. The most valued of these barks are Caribbee Bark (q.v.) and Saint Lucia Bark, the latter of which is the produce of *E. floribunda*, native of the more mountainous parts of the W. Indies.

EXOSTOME, n. *ĕks'ŏs-tōm* [Gr. *exō*, outside; *stoma*, a mouth]: in *bot.*, the outer opening of the foramen of the ovule.

EXOSTOSIS, n. *ĕks'ŏs-tō'sĭs* [Gr. *exostōsis*, a bony excrescence—from *ex*, out of; *ostĕŏn*, a bone: F. *exostose*]: in *anat.*, an unnatural projection or growth from a bone (see Tumor); in *bot.*, a wart-like excrescence.

EXOTERIC, a. *ĕks'ō-tĕr'ĭk*, or Ex'oter'ical, a. *-ĭ-kăl* [Gr. *exōterĭkos*, external; *exōtĕrŏs*, exterior—from *exō*, outside: L. *exōtĕrĭcŭs:* It. *esoterico:* F. *exotérique*]: public; external; opposed to *esoteric* or secret (see Esoteric); professed or taught openly. Ex'oter'icism, n. *-sĭzm*, exoteric doctrines or principles. Exoter'ics, n. *-ĭks*, lectures of Aristotle on rhetoric, to which all were admitted.

EXOTHECIUM, n *ĕks'ō-thē'shĭ-ŭm* [Gr. *exō*, without; *thēkē*, a case or sheath]: in *bot.*, the outer coat of the anther.

EXOTIC, n. *ĕgz-ŏt'ĭk* [Gr. *exōtĭkŏs*, foreign, strange—from *exō*, outside: L. *exōtĭcŭs:* F. *exotique*]: a plant, shrub, or tree introduced from a foreign country; something foreign: Adj. foreign; not native; also Exot'ical, a. *-ĭ-kăl.* Exot'icism, n. *-sĭzm*, state of being exotic. *Note.—Indigenous*, the opposite of *exotic*, means naturally belonging to a region.—*Exotics* or *Exotic plants* are usually those of which the native country differs so much in soil or climate from that into which they have been conveyed, that their cultivation is attended with difficulty, requiring artificial heat or other means different from those requisite in the case of indigenous plants. Some exotics seldom flower in their new home; and of those that flower, some never ripen their fruits and seeds.

EXPAND, v. *ĕks-pănd'* [L. *expandĕrĕ*, to spread out—from *ex*, out of; *pando*, I open or spread: It *espandere*]: to open; to spread out or enlarge a surface; to extend; to dilate. Expand'ing, imp. Expand'ed, pp. Expanse', n. *-păns'* [L. *ex*, *pansŭs*, spread]: a wide extent of space or body; extent; a spreading. Expan'sible, a. *-ăn'sĭ-bl*, capable of being extended. Expan'sibly, ad *-blĭ*. Expan'sibil'ity, n. *-bĭl'ĭ-tĭ*, capacity of extension in surface or bulk. Expan'sion, n. *-shŭn* [F.—L.]: act of expanding; state of being expanded; the enlargement of the surface or size of a body; extension (see Heat). Expan'sive, a. *-sĭv*, widely extended; having the power to dilate or spread out; having the capacity of being expanded. Expan'sively, ad. *-sĭv-lĭ*. Expan'siveness, n.—Syn. of 'expand': to enlarge; distend; spread; diffuse.

EX PARTE, a. *ĕks' pâr'tē* [see under Ex]: in *law*, executed by one side only; in *common conversation*, that which is related on one side only of the matter, as, an *ex parte* statement; one-sided.

EXPATIATE, v. *ĕks-pā'shĭ-āt* [L. *exspătĭātus*, extended, spread out—from *ex*, out of; *spătĭŏr*, I wander or walk about]: to enlarge on a subject in speech or writing; to be copious in discussion. Expa'tiating, imp. Expa'tiated, pp. Expa'tia'tion, n. *-ā'shŭn*, a wandering at large. Expa'tiator, n. *-tėr*, one who. Expa'tiatory, a. *-ă-tėr-ĭ.*

EXPATRIATE, *ĕks-pā'trĭ-āt* [mid. L. *expātrĭātus*, banished—from L. *ex*, out of; *pătrĭă*, one's country: F. *expatrier*, to banish]: to banish from one's native land. Expa'triating, imp. Expa'triated, pp. banished. Expa'tria'tion, n. *-ā'shŭn*, banishment from one's native country, voluntary or otherwise, but understood usually as voluntary. Expatriation, in international law, is the principle by which an individual, the subject or citizen of one country, is allowed to adopt another citizenship or national character. It includes naturalization, which is the act of adopting a foreigner and clothing him with all the privileges of a native citizen or subject. Though at one time doubted and even denied by certain European authorities, the right of expatriation of every free person owing no debts, and guilty of no crime is now generally conceded. See Naturalization.

EXPECT, v. *ĕks-pĕkt'* [L. *expĕctārĕ*, to await, to expect—from *ex*, out of; *specto*, I look at. It. *espettare*] to look out for; to wait for; to have an apprehension of something future; to entertain a belief that something will happen; to demand or require. Expec'ting, imp. waiting or looking for the arrival of. Expec'ted, pp.: Adj. looked for: apprehended. Expec'tant, n. *-pĕk'tănt* [F.—L.]: one possessed of the belief or hope that he will at some future time receive someting good: Adj. waiting; looking for. Ex'pecta'tion, n. *-tā'shŭn* [F.—L.]: the act of looking forward to; the state of expecting; the prospect of good to come; mean duration of life; value of a contingency (see Probability). Expectation week, week or period between Ascension Day and Pentecost Day, because during this time the apostles continued praying in earnest expectation of the Holy Spirit as promised. Expec'tancy, n. *-tăn-sĭ*, something expected; a looking for with pleasure, also Expec'tance, n. *-tăns.* Expec'tingly, ad. *-lĭ.* Expec'tative, a. *-tă-tĭv* [F.—L.]: constituting an object of expectation. Expec'ter, n. one who.—Syn. of 'expect': to wait; await; anticipate; look for; hope; think; believe; trust.

EXPECTATION, in Medicine, treatment of disease without active remedies, by merely observing its progress and averting its consequences through physiological means; as, for instance, when a fracture (q.v.) is treated by keeping the ends of the broken bone in their proper place, until the natural processes of repair are completed. Expectation is in this and other cases obviously a quite different thing from inaction, or the systematic doing of nothing with which it has been sometimes confounded.

EXPECTORATE, v. *ĕks-pĕk'tō-rāt* [L. *expĕctŏrātus*, expelled from the breast—from *ex*, out of; *pectus*, the breast; F. *expectorer*]: to eject matter from the air-passages or lungs by coughing and spitting; to cough up. Expec'torating, imp. Expec'torated, pp. Expec'tora'tion, n. *-rā'shŭn* [F.—L.]: the act of discharging matter from the air-passages or lungs; the phlegm or mucus ejected by coughing: its examination is of the utmost value in diseases of the chest (see Bronchi: Bronchitis: Chest: Consumption: Pneumonia: etc.). Expec'torant, n. a medicine that promotes discharges from the lungs: such medicines are Antimony, Squill, Ipecacuanha, Senega, Balsam of Tolu, Lobelia, Gum ammoniac, Asafœtida, Galbanum, etc.. Adj. that promotes the discharge of mucus secreted in the lungs or air passages. Expec'torative, a. *-tĭv*, having the quality of promoting expectoration.

EXPEDE, v. *ĕks-pēd'* [F. *expédier*—from L. *eapĕdīrĕ*, to let loose]: in *Scotch law*, to dispatch; to expedite. Expe'ding, imp. Expe'ded, pp.

EXPEDIENT, a. *ĕks-pē'dĭ-ĕnt* [F. *expédient*—from L. *eapĕdĭĕn'tem*, letting loose, extricating—from *ex*, *pĕdēs*, the feet: It. *espediente*]: fit or suitable for the purpose; tending to promote some end; proper or necessary under the circumstances: N. a contrivance or shift; that which serves to promote or help forward any end or purpose. Expe'dience, n. *-ĕns*, or Expe'diency, n. *-ĕn-sĭ*, suitableness for the end or purpose intended: propriety under the particular circumstances of a case advantage.—Syn. of 'expedient, n. and expediency, n. . resource; shift; contrivance; self-interest; resort; substitute; means.

EXPEDITE, v. *ĕxs'pē-dīt* [L. *expĕdītus*, loosed, sĕt free—from *ex*, out of, *pĕdēs*, the feet]: to quicken; to hasten; to facilitate the doing of anything: Adj. easy; nimble; active. Ex'pediting, imp. Ex'pedited, pp. Ex'peditely, ad. *-lĭ*, readily; hastily. Ex'pedi'tion, n. *-dĭsh'ŭn* [F —.L]: speed; quickness; march of an army for a hostile purpose; voyage of a ship or ships for any particular purpose; an enterprise or undertaking by a number of persons, the persons who form the undertaking. Ex'pedi'tionary, a. *-ėr-ĭ*, consisting in an expedition. Ex'pedi'tious, a. *-ŭs*, speedy; hasty; active; nimble. Ex'pedi'tiously, ad. *-lĭ*. Syn. of 'expedite, v.': to accelerate; speed; dispatch; urge; instigate,—of 'expeditious': ready; prompt; alert; quick.

EXPEL, v. *ĕks-pĕl'* [L. *expellĕrĕ*, to thrust out or away—from *ex*, out of; *pello*, I drive: It. *espellere*]: to drive or force out; to force to leave; to eject; to throw out; to exclude; to banish; to dismiss a student from a school or college. Expel'ling, imp. Expelled', pp. *-pĕld'*. Expel'lable, a. *-lă-bl*, that can be driven out.

EXPEND, v. *ĕks-pĕnd'* [L. *expendĕrĕ*, to weigh out, to spend money—from *ex*, out of; *pendo*, I weigh]: to lay out; to spend; to employ; to use. Expend'ing, imp. Expend′ed, pp. Expen′diture, n. *-pen′dĭ-tūr*, a laying out, as of money, time, or trouble; that which is thus expended; disbursement. Expense′, n. *-pĕns′* [L. *expensus*, weighed out]: cost; charges; a laying out, as of money; a consuming, as of labor or time; that which is used or consumed. Expense′less, a. without cost. Expen′sive, a. *-sĭv*, costly. high-priced; extravagant; given to expense. Expen′sively, ad. *-lĭ*. Expen′siveness. n. costliness.—Syn. of 'expense': price; value; worth; disbursement; outlay; consumption.

EXPENS′ES (or COSTS) OF A LAW′SUIT: charges exigible from the parties to lawsuits For the arrangements adopted in England, and for the usage in the United States, see Costs. In Scotland, these charges are commonly spoken of as expenses; and the pursuer of an action at law in Scotland almost always asks the court to pronounce decree in his favor for the expense of the proceedings which he has found it, or may find it, necessary to institute. On the other hand, the defender usually demands the expense attending his defense; and the general rule is, that the party found ultimate in the wrong has decree pronounced against him for the expense which he has occasioned to his opponent, as well as for the subject matter of the suit. As it is quite usual for a party to succeed in one branch of his action, and to fail in another; or to occasion unnecessary expense by the unskilful or careless mode in which he conducts some portion of it, even though on the whole he be in the right; the adjustment of the amounts incurred by the parties respectively often involves not only much nicety of calculation, but questions of considerable legal difficulty: see Auditor and Sheriff.

EXPERIENCE, n. *ĕks-pē′rĭ-ĕns* [F. *expérience*—from L. *experĭĕn′tĭă*, practice, experience—from *expĕrĭŏr*, I try, I put to the test]: knowledge gained by frequent trial or by experiment; practice; knowledge from observation. V. to try and know by practice or experiment; to know by trial. Expe′riencing, imp. Expe′rienced, pp. *-ĕnst:* Adj. taught by practice or by repeated observations; skilful by means of trial and use. Expe′rien′tial, a. *-ĕn′shăl*, derived from experience. Experien′tialism, n. *-shăl-ĭzm*, in *ment. phil.*, doctrine that all our ideas are derived from the experience of ourselves or of others, and that there are no intuitions. It has been called also Sensationalism. Experien′tialist, a. *-ĭst*, pertaining or relating to experientialism: N. one holding this doctrine.

EXPERIMENT, n. *ĕks-pĕr′ĭ-mĕnt* [F. *expérimenter*, to experience—from mid. L. *experĭmentārĕ*, to prove, to try: L. *expĕrimĕntum*, a proof, a trial]: a trial or operation for the purpose of discovering something unknown; a trial to confirm or disprove something doubtful: V. to search by trial. Exper′imenting, imp. making trials. Exper′imented, pp. searched out by trial or experiment. Exper′imen′tist, n. one who. Exper′imen′tal, a. *-tăl* [F.—L.]: known by trial or experiment. Exper′imen′tally, ad. *-lĭ*. Exper′imen′talist, n. one who makes experiments. Exper′imenta′tion, n. *-tā′shŭn*, exercise or practice in experiment. EXPER′IMEN′TATIVE, a. *-mĕn′tă-tĭv*, experimental. EXPER′IMENTER, n. one who. EXPER′IMEN′TUM CRU′CIS, *-mĕn′tŭm krô′sĭs* [L. *crucis*, of a cross—from *crux*, a cross]: a decisive or crucial experiment.—SYN. of ‘experiment, n.’: proof; test; effort; attempt, endeavor; essay, trial; exertion; experience; operation; act.

EXPER′IMENT and Observation: means by which we extend and confirm our knowledge of nature. An experiment is properly a proceeding by which the inquirer interferes with the usual course of a phenomenon, and makes the powers of nature act under conditions that, without his interference, would never, perhaps, have presented themselves all together. The introduction of experiment distinguishes the modern method of investigating nature from that of ancient times and of the middle ages. It is through experiment that physics and chemistry have made such rapid strides within the last two centuries. Through experiment, the investigator becomes master of the phenomena that he is considering; for he can contrive to set aside the unessential circumstances that so often conceal the real relations and conditions of things, and so can bring these out into the light. Experiments exhibited not for discovery of truth, but to aid in the exposition of truths already discovered, are sometimes called demonstrative experiments.

EXPERT, a. *ĕks-pėrt′* [F. *expert*, skilful—from L. *expertus*, tried, proved]: ready; dexterous; skilful by practice: N. *ĕks′pėrt*, one skilled in a science, an art, or in a profession; a scientific or professional witness: usually medical or scientific witnesses in a court of justice, selected for special qualifications, as in the case of an analysis of the contents of the stomach in suspected poisoning. The term is applied similarly to a person professionally skilled in handwriting, for detection of forgery of deeds and signatures. EXPERT′LY, ad. *-lĭ*. EXPERT′NESS, n. skill; readiness.—SYN. of ‘expert a.’: adroit; skilful; prompt.

EXPIATE, v. *ĕks′pĭ-āt* [L. *expĭātŭs*, made complete satisfaction for—from *ex*, out of; *pĭātus*, propitiated: It. *espiare:* F. *expier*]: to make reparation or satisfaction for; to atone for. EX′PIATING, imp. EX′PIATED, pp. EX′PIABLE, a. *-ă-bl*, that may be atoned for. EX′PIA′TION, n. *-ā′shŭn* [F.—L.]: the act of making satisfaction for a crime by which the guilt is done away; atonement; satisfaction; the means by which the atonement is made. EX′PIA′TOR, n. *-tėr*, one who. EX′PIA′TORY, a. *-ā′tėr-ĭ*, having power to make atonement.

EXPIRE, v. *ĕks pīr′* [F. *expirer*—from L. *exspīrārĕ*, to breathe or blow out—from *ex*, out of; *spīrō*, I breathe]: to breathe out; to exhale; to breathe the last breath; to die; to fail or be destroyed. EXPI′RING, imp. breathing out: ADJ. dying; ending; pertaining to, or uttered at, the time of dying. EXPIRED′, pp. *-pīrd′*. EXPI′RABLE, a. *-ră-bl*, that may come to an end. EX′PIRA′TION, n. *-pĭ-ră′shŭn* [F.—L.]: the act of forcing the air from the lungs; exhalation; conclusion; termination of a limited time. EXPI′RATORY, a.

-pī′ră-tėr-ĭ, pertaining to the emission of air from the lungs. Expiry, n. *ĕks-pī′rĭ*, the termination or end.

EXPISCATE, v. *ĕks-pĭs′kāt* [L. *expĭscātus*, searched out —from *ex*, out of; *piscis*, a fish]: to search out by artful means; to discover; to investigate. Expis′cating, imp. Expis′cated, pp. Ex′pisca′tion, n. *-kā′shŭn*, a thorough search or investigation.

EXPLAIN, v. *ĕks-plān′* [OF. *explaner*, to expand, to explain—from L. *explānārĕ*, to make plain or clear—from *ex*, out, *plānus*, smooth, plain, evident]: to make plain or evident; to clear of obscurity; to expound. Explain′ing, imp. Explained′, pp. *-plānd′*. Explain′able, a. *-ă-bl*, capable of being made plain to the understanding. Ex′plana′tion, n. *-plă-nā′shŭn*, the act of explaining; an exposition; an interpretation; sense explained; a mutual clearing up of a misunderstanding. Explan′atory, a. *-plăn′ă-tėr-ĭ*, serving to explain; containing an explanation. Explain′er, n. one who. Explanate, a. *ĕks′plă-nāt*, in *entom.*, having the sides of the prothorax so depressed and dilated as to form a broad margin.—Syn. of ‘explain’: to expiscate; elucidate; illustrate; interpret; clear up; define; describe; explicate; recite; recount; detail.

EXPLETIVE, a. *ĕks′plē-tĭv* [F. *explétif*—from L. *explētīvus*, filling up—from *ex*, out of; *plĕō*, I fill]: filling up or out; added for supply or ornament; not necessary to the sense: N. a word or syllable inserted for ornament, or only used to take up room; *colloquially*, a coarse or profane word. Ex′pletory, a. *-tėr-ĭ*, serving to fill up.

EXPLICATE, v. *ĕks′plĭ-kāt* [L. *explĭcātus*, unfolded or spread out—from *ex*, out of; *plĭcō*, I fold: It. *esplicare:* F. *expliquer*]: to interpret; to explain; to clear of difficulties. Ex′plicating, imp. Ex′plicated, pp. Ex′plicator, n. *-tėr*, one who. Ex′plicable, a. *-kă-bl*, that may be explained or interpreted. Ex′plica′tion, n. *-kā′shŭn* [F.—L.]: interpretation; explanation. Ex′plica′tive, a. *-kā′tĭv*, or Ex′plica′tory, a. *-tėr-ĭ*, serving to explain or interpret.

EXPLICIT, a. *ĕks-plĭs′ĭt* [F. *explicite*—from L. *explĭcĭtus*, disentangled, free from obstacles (see Explicate)]: clear; plain; not ambiguous or obscure. Explic′itly, ad. *-lĭ*. Explic′itness, n. clearness or plainness in language. Explicit function, n. in *math.*, a function whose value is expressed directly in terms of the variable; thus, in the equation

$$y = ax^2 + bx^{\frac{1}{2}} + c,$$

y is an *explicit function*. The term is opposed to *implicit function*, in which the relation between the function and variable is not directly stated; as, for example, in the equation

$$y^2 - 2px = 0,$$

in which *y* is an *implicit function* of *x*.—Syn. of ‘explicit’: express; unreserved; open; unambiguous; explanatory; unobscure.

EXPLODE, v. *ĕks-plōd′* [OF. *exploder*, to explode—from L. *explōdĕrĕ*, to drive out or off by clapping—from *ex*, out of; *plaudo*, I clap the hands in token of approbation—*lit.*, to drive out by clapping the hands]: to burst forth with sudden violence and noise; to change instantaneously into the gaseous state with enormous force; to burst with force and a report, as gunpowder; to drive from notice; to cry down, as a fashion or an opinion. EXPLO'DING, imp.: ADJ. having the property of bursting forth with violence and noise. EXPLO'DED, pp.: ADJ. rejected; condemned; burst violently. EXPLO'DER, n. one who. EXPLO'SION, n. *-plō'-zhŭn* [L. *explōsŭs*, driven off by clapping the hands: F. *explosion*]: a bursting forth with violence and noise; a sudden expansion with noise, the result of a change into the gaseous state; that which is thus exploded; the noise itself. EXPLOSIVE, n. *ĕks-plō'sĭv*, a substance such as gunpowder, dynamite, and the like, which, by contact with heat or by means of friction, is instantaneously changed into the gaseous state with immense force: ADJ. having a tendency to explode; having the property of exploding. EXPLO'SIVELY, ad. *-lĭ*. EXPLO'SIVENESS, n. liability to explode.

EXPLOIT, n. *ĕks-ployt'* [F. *exploit*, an exploit: OF. *esploit*, revenue, profit—from L. *explicĭtārĕ* for *explĭcārĕ*, to unfold, to spread out; *explĭcĭtus*, unfolded]: an act or a deed, especially a heroic one; an achievement; a deed of renown. EXPLOITATION, n. *ĕks'ploy-tā'shŭn*, or EXPLOIT'ING, n. [F. *exploitation*—from *exploiter*, to perform a feat]: the improvement of lands by cultivation, the felling of wood, the working of mines, and similar undertakings; the examination instituted for that purpose. EXPLOIT'ED, a. searched out and seized, as by an armed party.

EXPLOITS, *ĕks-ployts'*, RIVER OF: chief water-course of Newfoundland; flowing from s.w. to n.e. nearly the whole breadth of the island, and emptying into E. Bay; length 150 m. It is navigable for steamboats to the rapids, 12 m. from its mouth, and from that point by small boats to within 50 m. of the s.w. coast, and drains about 3,000 sq. m., nearly all the habitable land of the interior. Its valley is rich, and has abundance of timber, game, and fish.

EXPLORE, v. *ĕks-plōr'* [F. *explorer*—from L. *explōrārĕ*, to search out, to seek to discover—from *ex*, out of; *plōrō*, I cry out: It. *esplorare*]: to search into or examine closely with the eye in order to discover; to examine thoroughly, as to *explore* new countries; to search by any means; to try to find out. EXPLO'RING, imp. EXPLORED', pp. *-plōrd'*. EXPLO'RER, n. one who penetrates a new country for the purpose of thorough examination; also EX'PLORA'TOR, n. *-plō-rā'tėr*, one who. EX'PLORA'TION, n. *-shŭn* [F.—L.]: close search; strict examination. EXPLOR'ATORY, a. *-ă-tėr-ĭ*, serving to explore; searching out.—SYN. of 'explore': to search; examine; investigate; inspect; scrutinize; seek; penetrate.

EXPLO'SIVES: substances which, by the agency of heat or flame, or by friction or percussion, may be instantaneously changed into the gaseous state with great force. Modern explosives may be referred to classes, as follows: 1. Nitro-glycerine (q.v.) is used as the basis for a large number of characteristic compounds. 2. Fulminates (q.v.) form a definite class. 3. Nitro-cellulose (see Gun-cotton) is the basis for an important division. 4. Sprengel Explosives is a name for a distinct line of products (see below). 5. Picric Acid Compounds—*Melinite* (see below), etc. 6. Unclassified are agents such as *Emmensite* and *Gelbite* (see below).—For class 2, see Fulminates: examples of the other classes are given below. No claim to completeness can be made, as new explosives are appearing continually. The pressing need of a smokeless powder for the new rapid-firing and machine guns has greatly stimulated the energies of inventors. Speaking generally of all the explosives mentioned below, any of them can be used for torpedoes; all can be used for blasting. All are 'smokeless powders,' approximately; but it must be understood that this is, as yet, a question of degree only.

Nitro-glycerine Explosives.—The following two are examples of a numerous class in which Nitro-glycerine (q.v.) is the active agent, and is mixed with inert substances, as in dynamite, or with such as contribute to the explosion, as in gelatin explosives: *Explosive Gelatin*, Nitro-glycerine (q.v.) solidified by Gun-cotton (q.v.). Seven per cent. or more of gun-cotton is incorporated with nitro-glycerine, which mixes perfectly with it, giving a jelly-like product of high explosive value, and carrying no inert residue. The gun-cotton may be dissolved in a solvent such as methyl nitrate, and a mixing agent, such as acetic acid, may be added; and then the collodion thus made may be mixed with the gun-cotton: or, by simple heat, gun-cotton may be directly dissolved in nitro-glycerine. The ultimate product is, in all cases, identical. Camphor may be added to diminish its sensibility to shock. Its density is 1·6; at a temp. of 122° F. to 140° F., it softens a little. In the open air, it burns quietly if ignited.—*Forcite* (for blasting and torpedoes) mixture of Nitro-glycerine (q.v.) with cellulose, the latter gelatinized by heating in water under pressure. This was its original composition; but it has been modified, and now is made of thin explosive Gelatin (q.v.) and nitro-cellulose (Gun-cotton, q.v.), with sodium nitrate, coated with sulphur and wood tar. One per cent. of wood pulp is added to the tar. The effect of the mixture is to prevent the gelatin from being absorbed by the base, which represents a carrier rather than an absorbent. Explosive gelatin is used in the shells of the Zalinski gun.

Gun-cotton Explosives.—*Tonite* is a mixture of finely macerated gun-cotton with about its own weight of barium nitrate. *Punshon's gun-cotton* (blasting and torpedoes) is coated or impregnated with sugar, so as to preserve a granular constitution, and insure regularity of action. Other solids, such as wood fibre, manna sugar, glucose, and starch (Uchatius's white powder), have been nitrated for production of explosives.

SPRENGEL EXPLOSIVES.—Name given to a large class of explosives which promise to acquire considerable importance. The essential principle is the mixture of a combustible with an oxidizing agent, normally at the time of, or just before, explosion. One of this group, *Rack-a-rock* (for blasting), was used in the great explosion at Hell Gate, New York, 1885. This consists of compressed cartridges of chlorate of potash, which, immediately before use, are impregnated—(*a*) with dead oils or other liquid hydrocarbons, or (*b*) with nitro-benzol, or (*c*) with a mixture of dead oils and bisulphide of carbon; to the last, 3 per cent. of sulphur is sometimes added. This is given in detail, as typical of a class to which a great many explosives can be referred, such as the following: *Roburite*, *Securite*, and *Bellite*, mixtures of nitrate of ammonium, or its equivalent, with nitrated hydrocarbons—mostly for blasting.—*Favier's Explosive*, mass of a solid nitrate, such as ammonium, sodium, or potassium nitrate, which has been heated with solid paraffin, and pressed: sulphur may be added to the mixture: it is principally for blasting.—*Hellhoffite*, mixture of nitrated tar oils, or nitrated petroleum, with nitric acid. This was proposed to be used in ordnance as an explosive for shells. The two components were to be kept separate in the shell, and to be mixed automatically after discharge or on impact.—*Panclastite*, term embracing a series of mixtures of liquid hydrocarbons with solid or liquid oxidizing agent. This type is the invention of Eugène Turpin, of Paris, inventor of *Melinite*: it is principally for blasting.

PICRIC ACID EXPLOSIVES.—*Melinite* (Fr. *Mélinite*), explosive for use in guns and in shells; invention of Eugène Turpin, of Paris. Its composition, though held a secret by the French govt., is now known with some definiteness. Turpin found that picric acid could be exploded with great effect entirely alone, and that, very curiously, the maximum effect is produced by an incomplete combustion giving carbon monoxide gas (CO) as the characteristic product. But, in practice, the oxygen of the air instantly oxidizes this to the dioxide (CO_2), so that the air is made a *quasi* constituent of the explosive. Melinite is made by compressing, agglomerating, and molding picric acid into proper shapes. As an agglomerate, an aqueous solution of gum arabic or fats or heavy oils may be used, or collodion jelly diluted with 20 to 30 times its weight of alcohol and ether. Sometimes the picric acid is simply fused and molded by heat. The mixtures of agglomerants tend to decrease its sensibility. The most authentic view regards Melinite as essentially plain picric acid, exploded in practice by a fulminating primer. The most exalted claims are made for its power.—*Lydite* is an explosive compound resembling Melinite, and was extensively used by the British against the Boers in South Africa.

Unclassified Explosives.—*Emmensite*, for blasting, is prepared by melting together, in a paraffin bath, 5 parts of 'emmens' acid, 5 parts of a nitrate (sodium or potassium nitrate being recommended), and then incorporating 6 parts of picric acid. The so-called 'emmens' acid is obtained by dissolving commercial picric acid in fuming nitric acid of 50–52° Beaumé, at a gentle heat. On evaporation, the new acid is deposited in yellow rhombohedral crystals.

Gelbite is a form of Emmensite. A special quality of paper is chemically treated so as to become presumably nitro-cellulose, or a more or less perfect *Gun-cotton* (q.v.). This paper is impregnated or saturated with Emmensite. Gelbite appears like sheets of yellow paper. This is cut into strips or pieces of suitable size. Thus, for gun and pistol cartridges, a long strip is rolled to a suitable diameter, to fit the cartridge shell or barrel. It is for use also in blasting. One grain is said to be equal in power to seven grains of gunpowder.

EXPONENT, n. *ĕks-pō'nĕnt* [L. *exponen'tem*, putting or setting out—from *ex*, out of; *pōnō*, I put or set]: in *arith.* or *alg.*, the number or figure placed at the upper part on the right of a figure or letter to indicate the power to which it is to be raised, thus, b^2, 3^2—or the root of a quantity, thus, $b^{\frac{1}{2}}$, $3^{\frac{1}{2}}$; the representative of a party, as setting forth their views; one who expounds the views of another. Ex'ponen'tial, a. *-nĕn'shăl*, pertaining to exponents, or certain curves or equations, etc. When it was wanted to express the multiplication of unity for any number of successive times by the same number or quantity, e.g., $1 \times 5 \times 5$, or $1 \times a \times a \times a$, it was found a convenient abbreviation to write 1×5^2 and $1 \times a^3$, or simply, 5^2 and a^3; and the numbers, 2 and 3, indicating how often the operation of multiplication is repeated, were called exponents. But the theory of exponents gradually received extensions not originally contemplated, and has now an extensive notation of its own. Thus, $a^0 = 1$, $a^1 = a$, $a^{-2} = \frac{1}{a^2}$, $a^{\frac{1}{2}} = \sqrt{a}$, $a^{\frac{1}{3}} = \sqrt{a}$, $a^{\frac{2}{3}} = \sqrt{a^2}$, or the cube root of the square of a. Also, a^x is the xth power of a, x being any number integral or fractional; and, a continuing the same, x may be so chosen that a^x shall be equal to any given number. In this case, x is called the logarithm of the number represented by a^x. Considered by itself, a^x is an exponential. Generally, any quantity representing a power whose exponent is variable is an exponential, as a^x, x^x, y^x, etc. Exponential equations are those which involve exponentials, such as $a^x = b$, $x^x = c$. Exponents were introduced into algebraic notation by Descartes. Exponent proposition, proposition which states in regular logical form the meaning of another proposition which is obscure as judged by logical rules. Exponible, a. *-ĭble*, explicable; having the quality of admitting or of needing exposition. Exponible proposition, proposition that is obscure in the sense that it is not in one of the recognized logical forms.

EXPORT, v. *ĕks-pōrt′* [F. *exporter*—from L. *exportārĕ*, to carry out, to convey away—from *ex*, out of; *porto*, I carry: It. *esportare*]: to carry or send produce or goods out of a country, either by land or by water, in course of trade. EXPORT′ING, imp. EXPORT′ED, pp.: ADJ. carried out of a country in the regular course of traffic. EXPOR′TER, n. one who. EXPOR′TABLE, a. *-tă-bl*, that may be exported. EX′PORTA′TION, n. *-pōr-tā′shŭn* [F.—L.]: the act of conveying goods from one country to another, as by a merchant or trader. EXPORT, n. *ĕks′pōrt*, an article or commodity carried out of one country to another in the regular course of traffic.

EXPORTS: see IMPORTS AND EXPORTS.

EXPOSE, v. *ĕks-pōz′* [OF. *exposer*, to expose, to lay out —from L. *ex;* OF. *poser*, to set, to place: L. *exposĭtus*, put or set out—from *ex*, out of; *posĭtŭs*, put or placed]: to set out to public view; to exhibit; to disclose; to lay open; to make bare; to put in danger; to offer for sale. EXPO′SING, imp. EXPOSED′, pp. *-pōzd′:* ADJ. laid bare; unsheltered; uncovered; made public; offered for sale. EXPO′SER, n. one who. EXPO′SURE, n. *-pō′zhûr*, the state of being laid open to danger or inconvenience; situation of a place in regard to the points of the compass, or to sun and air; the laying open the character or conduct of any one; the act of exposing anything. EXPOSURE OF INFANTS: see INFANTICIDE. EX′POSI′TION, n. *-zĭsh′ŭn* [F.—L.]: a setting forth to public view; a laying open; an exhibition; an explanation or interpretation. EXPOS′ITIVE, a. *-pŏz′ĭ-tĭv*, or EXPOS′ITORY, a. *-tėr-ĭ*, explanatory; serving to explain. EXPOS′ITOR, n. *-ĭ-tėr*, one who explains, interprets, or expounds.

EXPOSÉ, n. *ĕks′pō-zā′* [F. *exposé*]: an exposing of something previously concealed; a formal recital of facts; reasons for explanation.

EXPOSITIONS. The Paris University of 1900 was open from April 15 to Nov. 11, and during its existence 50,000,000 people visited the grounds. The grand entrance to the exposition grounds was off the Place de la Concorde. The grounds of the exposition extended along two narrow strips of the banks of the Seine, and the total area was 336 acres. Access was had to the various parts of the grounds by means of an electric railway and a moving sidewalk. The systematic grouping of the objects exhibited was arranged along educational lines in 18 groups.

The Pan-American Exposition, held in Buffalo, N. Y., from 1901, May 1, to Nov. 2 following, was to illustrate the progress of civilization in the western hemisphere during the 19th century, and to promote trade between the American countries. The site occupied about 350 acres. In 1897 it was planned that the exposition should be held on Cayuga Island, near Niagara Falls, in 1899, and work was begun. The war with Spain intervened and the enterprise was postponed. When it was revised it was on broader lines, the original site on Cayuga Island being abandoned and grounds chosen in the n. part of Buffalo, within three miles of the business centre of the city. The principal buildings were arranged around a broad court. The Electric Tower, 375 ft. high, was the central attraction of the exposition, its main body being 80 ft. square and 200 ft. high. A spiral stairway in the center led up to a domed cupola, on which was poised a figure of the Goddess of Light, overlooking and dominating the entire exposition. The exhibits of the exposition were divided into fifteen classes, as follows: electricity and electrical appliances; fine arts—painting, sculpture, and allied works; graphic arts—typography, lithography, steel and copper plate printing, photo-mechanical processes, drawing, engraving, and book binding; liberal arts—education, music, engineering, public works, constructive architecture, hygiene and sanitation; ethnology, archæology, progress of labor and invention, Six Nations' Indian exhibit, isolated and collective exhibits; agriculture, agricultural products; machinery and appliances; foods and their accessories; horticulture, viticulture, floriculture; live stock; forestry and forest products; fish, fisheries and fish products, and apparatus for fishing; mines and metallurgy; machinery; manufactures; transportation exhibits, railways, vessels, vehicles, ordinance; exhibits from the Hawaiian Islands, Porto Rico, and the Philippines. The total attendance of the exposition was 8,120,048, and the total receipts for admissions were $2,467,066.88. See BUFFALO.

The South Carolina Interstate and West Indian Exposition was held in Charleston. It was opened 1901, Dec. 1, and presented an exhaustive exhibit of the material resources and industrial achievements of the Southern States. The exposition grounds covered 185 acres, and had 2,000 frontage on the Ashley river. The chief feature of the exposition was the Southern Garden, with surrounding court of palaces, built in the shape of a horseshoe. The court of palaces consisted in the Cotton Palace, Palace of Commerce, and Palace of Agriculture, the three buildings occupying an aggregate of 136,000 sq. ft. of floor space.

In 1903 the following expositions were authorized: An International Food Exposition at London, Eng. 1903; Agricultural and Industrial Exposition at Sivas, Turkey, 1903; Industrial Exposition at Osaka, Japan, 1903; British and Colonial Exposition at Cape Town, South Africa, 1903; the Louisiana Purchase Exposition at St. Louis, Mo., 1904 (see ST. LOUIS); and an International Peace Exposition at Johannesburg, Transvaal, 1904-5.

EX POST FACTO, *ĕks' pōst făk'tō* [L. *ex*, out of; *post-factus*, done afterward]: after the deed is done; applied to a law enacted to meet a particular crime after the deed has been committed. The Constitution of the United States prohibits the passing of such laws: the prohibition applies only to criminal and penal statutes.

EXPOSTULATE, v. *ĕks-pŏs'tū-lāt* [L. *eapŏstŭlātus*, demanded urgently, found fault—from *ex*, out of; *pŏstŭlātus*, required or demanded]: to reason earnestly with, as on some impropriety of conduct; to remonstrate in a friendly manner. Expos'tulating, imp. Expos'tulated, pp. Expos'tulator, n. *-tėr*, one who. Expos'tula'tion, n. *-lā'shŭn*, the act of reasoning with a person with reference to his conduct. Expos'tula'tory, a. *-lŭ'ter-ĭ*, containing expostulation.

EXPOSURE: see under Expose.

EXPOUND, v. *ĕks-pownd'* [OF. *espondre*, to explain—from L. *eapōnĕrĕ*, to put or set up—from *ex*, out of; *pōnō*, I set or place]: to make clear; to explain; to lay open; to interpret. Expound'ing, imp. Expound'ed, pp. Expound'er, n. one who.

EXPRESS, a. *ĕks-prĕs'* [F. *exprès*, plain, clear, on purpose—from L. *expressus*, squeezed out, represented—from *ex*, out of; *pressus*, pressed or sunk down]: plain; clear; given in direct terms; sent on a particular errand; intended for a particular purpose; copied, or resembling—applied to painting, sculpture, etc.; employed as a direct and speedy conveyance; used *adverbially*, on purpose; for a particular end: N. any direct and fast conveyance; a messenger or vehicle sent for a particular purpose; a special message: **V.** to press or squeeze out; to declare in words; to utter; to represent; to denote. Expres'sing, imp. Expressed', pp. *-prĕst':* Adj. squeezed out, as juice; uttered; set down in writing. Express'ly, ad. *-lĭ*, in direct terms; plainly. Expres'sion, n. *-prĕsh'ŭn* [F.—L.]: manner of utterance; mode of speech; declaration; a natural and lively representation of an object in painting or sculpture; the transient change which takes place in the permanent form of a face or figure while under the influence of various emotions; the modulation of the voice suited to the subject in music; the appearance of the countenance; the representation of an algebraic quantity by its proper symbols. Expres'sionless, a. wanting in expression. Expres'sible, a. *-prĕs'sĭ-bl*, that may be squeezed out; that may be uttered. Expres'sibly, ad. *-blĭ*. Expres'sive, a. *-sĭv*, serving to utter or represent; representing emphatically or clearly; significant. Expres'sively, ad. *-lĭ*. Expres'siveness, n. the quality of being expressive. Express'ness, n. the quality of being express. Expressure, n. *ĕks-prĕsh'ûr*, in *OE.*, expression; utterance; form or likeness; impression. —Syn. of 'express, v.': to declare; testify; intimate; signify; squeeze out; extort; elicit; indicate; exhibit designate;—of 'expression': term; word; phrase; sentence; proposition; period; paragraph; indication; form; mode.

EXPRESS, *ĕks-prĕs'* : organization for quick transmission of goods, merchandise, and parcels of all kinds. The express business in the United States had its rise in the custom of intrusting to stage-coach drivers, conductors of railroad trains, clerks of steamboats, commercial travellers, etc., parcels for delivery at their respective destinations. This was done without any system or organization, till William F. Harnden, of Boston, a railroad employé, conceived the idea of arranging for a regular package-delivery service between Boston and other cities and towns in Mass. He contracted with the Boston and Worcester r.r. co., 1838, for the transmission of packages over its line. In 1839, March, appeared, in the Boston newspapers, Harnden's announcement of a collection and delivery service between Boston and New York; and on March 4 he made his first trip, *via* the Boston and Providence r.r. and steamboat on Long Island Sound. His packages were carried in his hand-bag, and consisted of books from Boston publishers, orders from them to publishers in New York, and some notes of western, southern, and New York state banks, forwarded by brokers for exchange with issues of New England banks: a stout trunk soon took the place of the hand-bag. Besides carrying parcels, Harnden undertook to have an oversight of common freight, and to secure its prompt delivery in New York. His express service was extended to Philadelphia 1840, to Albany, N. Y., 1841. His partner, Dexter Brigham, went to England 1840, and established agencies in the principal European cities for express service proper, as well as for the sale of passage-tickets to emigrants, and the purchase and sale of foreign exchange. Harnden disposed of his Boston, Springfield, and Albany line abt. 1843 to Thompson & Co., who gave it their name. Harnden died 1845. A monument was erected to his memory, 1866, in the Mt. Auburn Cemetery, Cambridge, Mass., by 'the express companies of the United States.'

A rival line between Boston and New York was begun by Alvin Adams 1840: its collections and deliveries were for a year or two restricted to those 2 cities and the intermediate towns—New London, Norwich, and Worcester. Adams associated with himself, as partner, William B. Dinsmore, 1841, who took charge of the New York office: Adams & Co. opened their first office in Philadelphia 1843, and the same year Adams's partner and agent at Philadelphia associated himself with Samuel M. Shoemaker, to establish a line to Washington. At the outbreak of the civil war, Adams & Co.'s lines extended throughout a large part of New England, the whole south, and the northern states along the boundary between north and south. Henry Wells, an employé of Harnden, in association with Crawford Livingston, established a weekly line between Albany and Buffalo 1841: it became a daily line 1843, and the same year offices were opened at points on the Hudson river, between Albany and New York. Wells & Co. (one of the partners being William G. Fargo) opened a line to Chicago 1845; the same year they carried letters between New York and Buffalo for 6 cents, the post-office charging 12: Wells & Co. also established a European E. 1846, with offices in London and Paris. In 1852 the firm of Wells, Fargo & Co. was founded for conducting the E. business in the far west and the Pacific states and territories: it purchased the rights, good-will, etc., of the Erie E. Co, 1888.

The corporation known as the Adams Express Co. was formed 1854 by the union of Adams & Co., Harnden & Co., Thompson & Co., Kinsley & Co., and Hoey & Co.: in 1887 the Adams Express Co. had 7,800 employés, 1,826 wagons, 2,235 horses, and operated on 23,000 m. of railroad. The American Express Co. is a consolidation, effected 1850, of Livingston & Fargo, Wells & Co., and Butterfield, Warner & Co. The Eastern Express Co. is a consolidation of several individual lines in the New England states. The National Express Co. had for its nucleus Pallen, Virgil & Stone's express, founded 1848, as a line between New York and Montreal. The nucleus of the United States Express Co. was the express business of the New York and Erie r.r.: it has absorbed the Delaware and Lackawanna Express Co., the Western Express Co., and the Baltimore and Ohio Express Co. Besides safe delivery of goods, E. companies undertake to collect, on account of merchants, the price of goods sold and forwarded by express: this process is known as the system of C. O. D., or 'collect on delivery.' Such parcels are marked on the outside with the amount to be collected, and are accompanied by the merchant's bill. The cost of the collection is paid by the consignor; that of transportation either by the consignee or the consignor, according to agreement. This feature of the E. business is growing rapidly, especially within a radius of 50 m. around the chief cities, where merchants deliver their goods by express, free of transportation charge. The E. companies have also a system of money-orders payable at any of their offices throughout the country. The most profitable branch of the E. business is the collection of notes, drafts, and accounts, and the transportation of gold and silver coin, banknotes, deeds, bullion, and valuables of all kinds. The U. S. govt. contracts with one of these companies (the U. S. E. Co. 1890) for the carrying and delivery of all public moneys and securities. The contracts between the E. companies and railroad companies are based on a given minimum rate *per diem*, for a stipulated amount of traffic; when that amount is exceeded, an additional charge is made. Before the law, an E. co. is a 'common carrier,' with the same liabilities as any other common carrier, notwithstanding any declaration on its bills of lading that it is not to be so considered.

The New York *Commercial and Financial Chronicle*, 1890, Nov. 29, reports as follows on the finances of the E. cos. named below: Adams E. Co., stock, par value $100, amount outstanding $12,000,000: American E. Co., stock, par value $100, amount outstanding $18,000,000; dividends of 6 per cent. yearly have been paid since 1879: United States E. Co., stock, par value $100, amount outstanding $10,000,000; purchased the Baltimore and Ohio E. Co. 1887; dividends payable May and Nov.; 1890 the semi-annual dividends were 2 per cent. each: Wells, Fargo & Co. E., stock, par value $100, amount outstanding $6,250,000; no annual reports or information; dividends of 8 per cent. yearly have been paid for many years.

On the New York stock exchange, 1890, Dec. 5, Adams E. Co. stock was sold at $145; American E. Co stock $115; Wells, Fargo & Co. stock $140½.

EXPRESSIONE, *ĕks-prĕs-sē-ō'nē*, Con, or Espressivo, *ĕs-prĕs-sē'vō:* Italian term in music, meaning with expression; impassioned, with pathos. Where the word appears at the beginning of a composition, the piece must be executed throughout with feeling. 'Expressione' frequently appears above certain passages which alone are to be performed so, while the harmony in the accompaniment goes on quietly.

EXPRESSIVO, adv. *ĕks-prĕs-sē'vō*, or Espressivo, adv. *ĕs-prĕs sē'vō* [It. *espressivo*]: in *mus.*, with expression.

EX PROFESSO, phrase, *ĕks pro-fĕs'ō* [L.]: by profession; professedly.

EXPROPRIATE, v. *ĕks-prō'prĭ-āt* [mid. L. *exproprĭātus*—from L. *ex*, out of; *proprĭŭs*, one's own]: to hold no longer as one's property; to make no longer one's own. Expropria'tion, n. *-ā'shŭn* [F. *expropriation*, a taking possession of a debtor's landed property]: the act of holding no longer as one's own.

EXPULSION, n. *ĕks-pŭl'shŭn* [F. *expulsion*—from L. *expulsiōnem*, a driving out—from *ex*, out of; *pulsus*, driven: It. *espulsione*]: the act of expelling by authority, force, or violence; ejectment. Expul'sive, a. *-sĭv*, having the power of driving out. Expulse, v. *ĕks-pŭls'*, in *OE.*, to drive out; to expel.

EXPUNGE, v. *ĕks-pŭnj'* [L. *expungĕrĕ*, to blot out—from *ex*, out of; *pungo*, I prick or puncture: It. *espungere*]: to blot or wipe out; to efface; to obliterate. Expung'ing, imp.: Adj. blotting out; erasing. Expunged', pp. *-pŭnjd'*.—Syn. of 'expunge': to erase; cancel; strike out; destroy.

EXPURGATE, v. *ēks-pėr'gāt* [L. *expŭrgātus*, purged quite, purified—from *ex*, out of; *pŭrgātus*, cleansed: It. *espurgare*]: to cleanse; to purify; to purge. Expur'gating, imp. Expur'gated, pp.: Adj. cleansed; purified. Expur'gator, n. *-gă-tėr*, one who expurgates or purifies. Ex'purga'tion, n. *-gā'shŭn*, the act of cleansing or purifying. Expur'gato'rial, a. *-tō'rĭ-ăl*, cleansing or freeing from blame. Expur'gatory, a. *-gă-tėr-ĭ*, serving to purify or cleanse. Index Expurgatorius, *ĭn'dĕks ĕks-pėr'gă-tō'-rĭ-ŭs*, a list of works condemned by the R. Cath. Ch. as either heretical or dangerous to the Roman Catholic faith.

EXQUISITE, a. *ĕks'kwĭ-zĭt* [L. *exquisītus*, carefully sought out, excellent—from *ex*, out of; *quæsītus*, sought or searched for: F. *exquis*, exquisite, excellent—*lit.*, carefully sought out]: perfect; complete; highly finished; capable of nice or delicate perception; very sensibly felt; nice; delicate; exact; extreme, as pain or pleasure: N. one nice or refined in dress; a fop; a dandy. Ex'quisitely, ad. *-lĭ*. Ex'quisiteness, n. state of being exquisite; nicety; keenness.—Syn. of 'exquisite, a.': refined; consummate; matchless; accurate; exceeding; extreme; keen; fastidious.

EXSANGUIOUS, a. *ĕk-săng'gwĭ-ŭs*, or Exsan'guinous, a. *-gwĭ-nŭs* [L. *exsanguis*, bloodless—from *ex*, out of; *sanguis*, blood]: without blood. Ex'sanguin'ity, n. *-gwĭn'ĭ-tĭ*, state of being without blood.

EXSCIND, v. *ĕk-sĭnd'* [L. *ex*, from; *scindo*, I cut or tear]: to cut off from fellowship; to remove or separate entirely. Exscind'ing, imp. Exscind'ed, pp.

EXSERTED, a. *ĕk-sėr'tĕd* [L. *exsertus*, thrust forth]: in *bot.*, projecting beyond someting else, as stamens beyond the corolla.

EXSICCATE, v. *ĕk'sĭk'kāt* [L. *exsiccātus*, made quite dry—from *ex*, out of; *siccus*, dried up]: to deprive of moisture. Exsiç'cating, imp. Exsic'cated, pp. dried up. Exsic'cant, a. *-kănt*, having power to dry up. Ex'sicca'tion, n. *-kā'shŭn*, the drying up of solid bodies; the expulsion of moisture from solid bodies by heat, pressure, or by any other means. Exsiccator, n. *ĕks'sĭk-kā-tėr*, apparatus for drying purposes. In most cases such substances are used as chloride of calcium, which readily absorbs moisture.

EXSTIPULATE, a. *ĕks-stĭp'ū-lāt* [L. *ex*, without; *stipŭlă*, a stalk or stem]: in *bot.*, destitute of stipules.

EXSUDE and EXSUDATION: old spellings of Exude and Exudation: see Exude.

EXSUFFLICATE, a. *ĕks-sŭf'lĭ-kāt* [mid. L. *exsufflārĕ*, to blow at, to despise]: in *OE.*, blown or puffed out; empty; contemptible.

EXTANT, a. *ĕks-tănt'* [L. *exstantem*, projecting—from *ex*, out of; *stans*, standing]: in existence; not destroyed or lost.

EXTEMPORANEOUS, a. *ĕks-tĕm'pō-rā'nĭ-ŭs* [Sp. *extemporaneo*, extemporaneous—from L. *ex*, out of; *tempus*, time, *tempŏră*, times]: done or uttered without preparation; unpremeditated; not having the aid of ms. Extem'pora'neously, ad. *-lĭ*. Extem'pora'neousness, n. Extem'porary, a. *-rėr-ĭ*, unpremeditated; without preparation; sudden. Extem'porar'ily, ad. *-lĭ*. Extempore, ad. *ĕks-tĕm'pō-rĕ* [L. *ex*, *tempŏrĕ*]: on the spur of the moment, without preparation; without the aid of ms. Extem'porize, v. *-rīz*, to speak without preparation; to improvise. Extem'porizing, imp. Extem'porized, pp. *-rīzd*. Extem'porizer, n. *-rī-zėr*, one who.

EXTEND, v. *ĕks-tĕnd'* [L. *extendĕrĕ*, to spread out; *extensus*, spread out—from *ex*, out of; *tendo*, I pull or stretch: It. *estendere:* F. *étendre*]: to stretch in any direction, to any distance; to enlarge or increase; to diffuse; to reach: to impart. Extend'ing, imp. Extend'ed, pp.: Adj. spread; expanded. Extend'edly, ad. *-lĭ*. Extend'er, n. he or that which extends. Exten'dible, a. *tĕn'dĭ-bl*, capable of being stretched or enlarged: in *law*, that may be seized under a writ of extent and valued. Extendibility, n. *-bĭl'ĭ-tĭ*, capability of being extended, stretched, enlarged, or expanded. Extensible, a. *ĕks-tĕn'sĭ-bl* [L. *extensus*, stretched out]: that may be extended. Exten'sibil'ity, n. *-bĭl'ĭ-tĭ*, the capacity of being extended. Exten'sile, a. *-sĭl*, capable of being extended. Exten'sion, n. *tĕn'shŭn* [F.—L.]: the act of enlarging or stretching out; enlargement; an essential property of bodies, because they must occupy a part of space, however small; in *logic*, the number of objects which a term includes. Exten'sive, a. *-sĭv*, large; wide; Exten'sively, ad. *-lĭ*. Extensiveness, n. state of being extensive; largeness; wideness. Exten'sor, n. *-sėr*, in *anat.*, a muscle which serves to extend or straighten a joint: Extent, n. *ĕks-tĕnt'* [L. *extentus*, stretched out]: the space or degree to which a thing is extended; compass; size; in *O.E.*, extended. Extent, in *English law*, writ issuing out of the court of exchequer to compel payment of debts to the crown. In order to warrant the issue of this writ, the debt must be a debt of record (q.v.). As to *extent* in Scotland, there were no taxes in feudal times. The king was supported by the rents of his property lands, and by the occasional profits of superiority—ward, non entry, marriage, escheat, and the like—known by the general name of casualties (q v.). Beyond these, and the expenses which the discharge of his ordinary duties to his superior imposed on him, the vassal was not liable to be taxed. But to this rule there were some exceptions. When it became necessary to redeem the king from captivity, to provide a portion for his eldest daughter, or to defray the expense of making his eldest son a knight, a general contribution was levied. One of these occasions occurred when Alexander III. betrothed his daughter Margaret to Eric, the young king of Norway, and engaged to give her a tocher of 14,000 merks. This sum was far beyond the personal resources of the king, and consequently fell to be levied by a land-tax—land and its fruits being then the only appreciable species of property. But if the tax was to be levied fairly and equally, this could be only by ascertaining the value of the whole lands in the kingdom, as had been done in England in the time of Edward I. (4 Edw. I. i anno 1276). Whether this was the first general valuation of all the lands of Scotland is not known; but it is certain that the valuation here spoken of was long known as *the old extent.* As such, it is spoken of in the act or indenture of 1326, July 15, by which the parliament of Scotland agreed to give to King Robert Bruce the tenth penny of all the rents of the laity during his life. See Valuations of Land.—Syn. of 'extend:' to increase; expand; widen; dilate; distend; stretch.

EXTENDANT, a.: in *her.*, the same as Displayed; having the wings expanded.

EXTEN'SION, in Logic: number of the objects which a term includes; contrasted with Comprehension: the two mutually explain each other. A general notion is said to be extensive according to the extent of its application, or the number of objects included under it. Thus Figure is a term of very great extension, because it contains in its compass many varieties, such as round, square, oblong, polygonal, etc. In like manner European is more extensive than German, man than European, animal than man, organized being than animal. The highest genera are formed by taking in a wider range of objects. Matter and Mind are the most extensive classes that we can form. For, though a higher genus is sometimes spoken of, viz : Existence, it is maintained that to call this a class is to generalize beyond real knowledge, which does not begin till we have at least two actual things to contrast with each other. It is said that that which can be contrasted only with nonexistence, nonentity, or nothingness, gives no genuine knowledge: no property can be affirmed of it apart from the thing itself; this is by some deemed open to question. Matter, in its contrast to mind, is a real cognition; and *vice versâ*, mind in its contrast to matter. These, then, on the above principle, are the most extensive terms that have any real knowledge attached to them. But this property of extension is gained by dropping more and more of the peculiarities of the included individuals; 'organized being,' in order to include both plants and animals, must drop from its signification what is peculiar to each, and mean only what is common to both. In short, these very extensive notions have a very *narrow* signification ; it is the less extensive that have most meaning. The meaning of 'Man,' or the number of attributes implied in this generic expression, is large. Everything that goes to a human being—the human form and organization, the mental attributes of reason, speech, etc.—is expressed by this term, which is on that account said to be more COMPREHENSIVE than animal or organized being. Thus it may be seen that the greater the extension, the less is the comprehension ; and the greater the comprehension, the less is the extension. An individual-name is the term of greatest comprehension, and of least extension. 'Socrates' comprehends all that is common to men and to philosophers, together with all that is peculiar to himself. On the logical uses of this distinction, see Sir W. Hamilton's *Lectures on Logic*, i. 140.

EXTENUATE, v. *ĕks-tĕn'ū-āt* [L. *extĕnŭātus*, made very thin—from *ex*, out of; *tenŭātus*, made thin: It. *estenuare:* F. *exténuer*]: to lessen; to diminish; to palliate, as a fault or crime; to mitigate. EXTEN'UATING, imp.: ADJ. lessening; diminishing. EXTEN'UATED, pp. EXTEN'UA'TINGLY, ad. *-lĭ*. EXTEN'UATOR, n. *-tėr*, one who. EXTEN'UA'TION, *-ā'shŭn* [F.—L.]: the act of representing any fault or crime less than it is; palliation. EXTEN'UA'TORY, a. *-tėr-ĭ*, that extenuates or palliates.—SYN. of 'extenuate': to palliate; hide; cover; conceal.

EXTERIOR, a. *ĕks-tē'rĭ-ėr* [OF. *exterieur*, the exterior—from L. *exterĭōrem*, outer—from *extĕrŭs*, on the outside, strange]: outward; external; relating to the outside or outer surface: N. the outward surface; that which is external. EXTE'RIOR'ITY, n. *-ŏr'ĭ-tĭ*, the quality of being exterior; outwardness; surface. EXTE'RIORLY, ad. *-ėr-lĭ*, externally. EXTE'RIORS, n. plu. *-ėrz*, outward parts of a thing; external deportment or forms. EXTERIOR SLOPE, in *mil.*, the surface of the parapet which faces the ditch.—SYN. of 'exterior, a.': external; outward; extraneous; extrinsic; foreign; outside.

EXTERMINATE, v. *ĕks-tėr'mĭ-nāt* [L. *extermĭnātus*, driven out or away—from *ex*, out of; *termĭnus*, a limit: F. *exterminer*, to put an end to]: to destroy utterly; to root out; to eradicate. Exter'minating, imp.: Adj. destroying utterly; eradicating. Exter'minated, pp.: Adj. utterly destroyed; eradicated. Exter'mina'tor, n. *-tėr*, he or that which exterminates. Exter'mina'tion, n. *-nā'shŭn* [F.—L.]: total destruction; eradication. Exter'mina'tive, n. *-nā'tĭv*, that exterminates or utterly destroys. Exter'mina'tory, a. *-tėr-ĭ*, tending or serving to destroy totally. Exter'mine, v. *-mĭn*, in *OE.*, to exterminate; to destroy utterly. Exter'mining, imp. Exter'mined, pp. *-mĭnd.*

EXTERNAL, a. *ĕks-tėr'năl* [L. *extèrnus*, outward: It. *esterno:* F. *externe*]: outward; not within; visible; foreign. Exter'nals, n. plu. *-nălz*, the outward parts; outward forms or rites. Exter'nally, ad. *-lĭ.* Ex'ternal'ity, n. *năl'ĭ-tĭ*, state of being external. Extern, a. *ĕks-tėrn'*, in *OE.*, outward; visible; coming from without: N. a student or pupil who does not reside within a college or seminary; a day scholar in Rom. Cath. schools.

EXTERRANEOUS, a. *ĕx-tĕr-rā'nē-ŭs* [L. *exterraneus; ex*, out, away; *terra*, earth or land]: belonging to or coming from abroad; foreign.

EXTERRITORIAL, a. *ĕks-tĕr-rĭ-tō'rĭ-al* [prefix *ex;* Eng. *territorial*]: beyond the jurisdiction of the laws of the country in which one resides.

EXTERRITORIALITY, n. *ĕks-tĕr'rĭ-tŏ-rĭ-ăl'ĭ-tĭ* [L. *ex*, out of, and Eng. *territory*]: in *diplomacy*, the right possessed by the representatives of foreign powers to live in the country to which they are accredited under the laws of the country to which they belong.

EXTINCT, a. *ĕks-tĭngkt'* [L. *exstinctus*, put out, quenched (see Extinguish)]: quenched; put out; being at an end; no longer existing. Extinc'tion, n. *-tĭngk'shŭn* [F.—L.]: the act of putting out; the state of being quenched or suppressed. Extinc'ted, a. *-tĭngk'tĕd*, in *OE.*, extinguished.

EXTINE, n. *ĕks'tĭn* [L. *exter*, on the outside]: in *bot.*, the outer covering of the pollen-grain; primine.

EXTINGUISH, v. *ĕks-tĭng'gwĭsh* [L. *extinguĕrĕ*, to put out, to quench—from *ex*, out of; *stinguo*, I put out, I quench: F. *éteindre;* OF. *esteindre*, to put out fire: comp. Gael. *teine*, fire]: to put out; to destroy; to suppress; to put an end to. Extin'guishing, imp. Extin'guished, pp. *-gwĭsht*, put out; quenched; suppressed. Extin'guisher, n. he or that which extinguishes; that which puts out a candle. Extin'guishable, a. *-ă-bl*, that may be quenched or suppressed. Extin'guishment, n. *-mĕnt*, the act of suppressing, destroying, putting an end to, or abolishing; extinction destruction, abolition; the state or condition of being utterly destroyed, exterminated or suppressed; extinction, destruction; in *law*, the extinction or ending of an estate, right, etc., by means of merging or consolidating it with another, generally one more extensive.

EXTIRPATE, v. *ĕks-tėr'pāt* [L. *exstirpātus*, plucked up by the stem or root—from *ex*, out of; *stirps*, a root: It. *estirpare:* F. *extirper*]: to root out; to destroy wholly; to remove completely; to exterminate. Extir'pating, imp. Extir'pated, pp.: Adj. rooted out; totally destroyed. Extir'pator, n. *-tėr*, one who, or the thing which. Extir'pable, a. *-pă-bl*, that may be rooted out. Ex'tirpa'tion, n. *-pā'shŭn* [F.—L.]: total destruction; the act of rooting out. Extir'patory, a. *-pă-tėr-ĭ*, that roots out or destroys. Extirp, v. *ĕks-tėrp'*, in *OE.*, to root out; to eradicate. Extirp'ing, imp. Extirped', pp. *-tėrpt'*.—Syn. of 'extirpate': to eradicate; destroy; root out; pull up; pluck up; expel.

EXTOL, v. *ĕks-tŏl'* [L. *extollĕrĕ*, to raise up or elevate—from *ex*, out of; *tollo*, I raise: It. *estollere*]: to praise highly; to laud; to celebrate in words. Extol'ling, imp. Extolled', pp. *-tŏld'*. Extol'ler, n. one who.—Syn. of 'extol': to praise; applaud; magnify; commend; laud; glorify; approve.

EXTORT, v. *ĕks-tŏrt'* [L. *extortus*, twisted or wrenched out—from *ex*, out of; *tortus*, turned about, twisted: F. *extorquer*]: to wrest or wring from; to draw from by force; to gain from by violence, threats, or injustice: Adj. in *OE.*, extorted. Extort'ing, imp. Extort'ed, pp. drawn from by compulsion. Extor'sive, a. *-tŏr'sĭv*, tending to draw from by compulsion. Extort'er, n. one who. Extor'tioner, n. *-tŏr'shŭn-ėr*, one who practices extortion. Extor'tion, n. *-shŭn* [OF. *extortion*—L]: the act or practice of wresting from; oppressive exaction; rapacity—generally said of money. Extor'tionary, a. *-ėr-ĭ*, practicing extortion. Extor'tionate, a. oppressive. Extor'tionist, n. one who.

EXTRA, *ĕks'tră* [L. *extra*, on the outside, without]: a common prefix, denoting 'above or beyond usual'; in excess; additional; out of. Extra-parochial, beyond the limits of any parish. Extra-judicial, out of ordinary court procedure. Extra, a. beyond what is usual, or has been agreed upon; additional, as *extra* work, *extra* hours, *extra* quantity. Ex'tras, n. plu. *-trăs*, things in addition to what is due or expected. Extra-axillary, *-ăks'ĭl ėr ĭ*, in *bot.*, removed from the axil of the leaf, as in the case of some buds Extra-belief, n. Matthew Arnold's rendering of the German *Aberglaube*, which he does not consider adequately translated by the word superstition. Extra-constellary, a. *-kŏn stĕl'lėr-ĭ* [prefix *extra;* Eng. *constellary*]: in *astron.*, term applied to stars not classed under any constellation. Extra-dotal, a. *-dō'tal*, not belonging to dower; as, *extradotal* property. Extra-foliaceous, a. *ĕks-tra-fō-lĭ-ā'shŭs*, in *bot.*, beyond a leaf; away from the leaves or inserted in a different place from them. Extra-mundane, *-mŭn'dān* [L. *mundus*, the world]: beyond the limits of the material world. Extra-mural, *-mū'răl* [L. *murus*, a wall]: without or beyond the walls, as of a fortified city, or of a university. EXTRA-PROFESSIONAL, not within the usual limits of professional business or habits. EXTRA-PROVINCIAL, a. *-prō-vĭn'shal,* out of or beyond the limits of the same province or jurisdiction: not under the jurisdiction of the same archbishop. EXTRA-REGULAR, a. *-rĕg'ū-lar,* out of rule; beyond ordinary rules. EXTRA-TERRITORIALITY, n. *-tĕr-rĭ-tō-rĭ-al'ĭ-tĭ,* immunity from a country's laws like that enjoyed by an ambassador. EXTRA-VASCULAR, a. *văs'kū lar,* being out of the proper vessels. *Note.*—When EXTRA is employed as a prefix, a hyphen is usually placed between it and the word.

EXTRACT, v. *ĕks-trăkt'* [L. *extractus,* drawn out or forth—from *ex,* out of; *tractus,* drawn or dragged]: to draw out; to take out or from; to select: N. *ĕks'trăkt,* that which is drawn out or from something else; a selection, as from a book; a tincture evaporated to a paste; a decoction; in *OE.,* descent. EXTRAC'TING, imp. *-trăk'tĭng.* EXTRAC'TED, pp.: ADJ. drawn or taken out. EXTRAC'TIBLE, a. *-tĭ-bl,* that may be extracted. EXTRAC'TOR, n. *-tėr,* that which extracts. EXTRAC'TION, n. *-shŭn* [F.—L.]: the act of drawing out or from; birth; lineage; descent. EXTRAC'TIVE, a. *-tĭv,* that may be extracted; term applied to certain organic matters resembling humine, found in soils during decay of vegetable matter, and precipitated during the concentration of water solutions. EXTRACTUM CARNIS, *ĕks-trăk'tŭm kâr'nĭs* [L. extract of flesh], or EXTRACT OF MEAT, obtained by acting on chopped meat by cold water, and gradually heating, when about one-eight of the weight of the meat dissolves out, leaving an almost tasteless insoluble fibrine. The extract of meat contains the salts and savory constituents of the meat, and is a light and stimulating article of food: see BEEF-TEA: BROTH. It may be concentrated into small bulk, and when desired, may be afterward treated with water, and being heated, forms an agreeable light soup, though rather stimulating than nutritious: see PRESERVES.

EXTRAC'TION OF ROOTS: process in mathematics: see EVOLUTION. The roots which have in practice to be most frequently extracted are the *square* and *cube* roots. It is proposed to explain the rule for their extraction as it is given in books of arithmetic. And first of the square root. The square of $a + b$ is $a^2 + 2ab + b^2$, and we may obtain the rule by observing how $a + b$ may be deduced from it. Arranging the expression according to powers of some letter a, we observe that the square root of the first term is a,

$$\begin{array}{rl}
 & a^2 + 2ab + b^2(a + b \\
 & a^2 \\
\cline{2-2}
2a + b) & \qquad 2ab + b^2 \\
 & \qquad 2ab + b^2 \\
\cline{2-2}
\end{array}$$

Subtract its square from the expression and the remainder is $2ab + b^2$. Divide $2ab$ by $2a$, and the result is b, the other term in the root. Multiply $2a + b$ by b, and subtract the product from the remainder. If the operation does not terminate, it shows that there is another term in the root. In this case we may consider the the two terms $a + b$ already found as one; and as corresponding to the term a in the preceding operation; and the square of this quantity having been by the preceding subtracted from the given expression, we may divide the remainder by $2(a + b)$ for the next term in the root, and for a new subtrahend multiply $2(a + b) +$ the new term, by the new term; and the process may be repeated till there is no remainder. The rule for extracting the square root of a number is an adaptation of this algebraic rule. In fact, if the number be expressed in terms of the radix of its scale, it is seen to be a concealed algebraical expression of the order we have been considering. Thus, $\mathrm{N} = ar^n + br^{n-1} \ldots + q$. The number 576 in the denary scale may be written $5 \times 10^2 + 7 \times 10 + 6$; and treating it as an algebraical expression, we should find its root to be $2 \times 10 + 4$, or 24. The only part of the arithmetical rule now requiring explanation is the rule of pointing. As every number of one figure is less than 10, its square must be less than 10^2; generally, every number of n figures is less than 10^n (which is 1 followed by n ciphers); but also every number of n figures is not less than 10^{n-1}, and therefore its square is not less than 10^{2n-2}—which is the smallest number of $2n - 1$ figures. Also, 10^{2n} is the smallest number of $2n + 1$ figures. It follows that the square of a number of n figures has either $2n$ or $2n - 1$ figures. If, then, we put a point over the units place of a number of which the root is to be extracted, and point every second figure from right to left, the number of points will always equal that of the figures in the root. If the number of figures be even, the number will be divided into groups of two each; if odd, the last group will contain only a single figure.

The rule for the extraction of the cube root of a number is deduced from that for the extraction of the cube root of an algebraical expression in the same way as in the case of the square root. The cube of $(a + b)$ is

$$\begin{array}{rl} & a^3 + 3a^2b + 3ab^2 + b^3(a + b \\ & a^3 \\ \hline 3a^2) & \quad 3a^2b + 3ab^2 + b^3 \\ & \quad 3a^2b + 3ab^2 + b^3 \\ \hline \end{array}$$

Hence the rule in algebra. Arrange the expression according to descending powers of a, the cube root of the first term a^3 is a, the first term of the root. Subtract its cube from the expression, and bring down the remainder. Divide the first term by $3a^2$, and the quotient is b, the second term of the root. Subtract the quantity $3a^2b + 3ab^2 + b^3$. If there is no remainder, the root is extracted. If there is, proceed as before, regarding $a + b$ as one term, corresponding to a in the first operation. Let, for example, $a + b = a^1$, then $3a^{1\,2}$ is the new trial divisor. If c be the new term or third figure of the root, then the quantity to be subtracted to get the next remainder is $3a^{1\,2}c + 3a^1c^2 + c^3$, and so on till there is no remainder. The rule of pointing in the extraction of the cube root may be proved, as in the case of the square root, by showing that the cube of a number of n figures contains $3n$, $3n - 1$, or $3n - 2$ figures; and, therefore, if we put a point over the units place, and on each third figure, we shall have as many periods as there are figures in the root.

A rule for the extraction of any root of a number may be got from considering how, from the expansion of $a + b$ to the nth power, or $a^n + na^{n-1}b +$, etc., the root $a + b$ is to be obtained: see EVOLUTION and INVOLUTION.

EXTRACTS, in Medical Usage: preparations of vegetable principles, got either by putting the plants in a solvent or menstruum, and then evaporating the liquid down to about the consistency of honey, or by expressing the juice of the plants and evaporating; this last is properly *inspissated juice*. Extracts, therefore, contain only those vegetable principles that are either held in solution in the juices of the plants themselves, or are soluble in the liquid employed in extracting them, and at the same time are not so volatile as to be lost during evaporation. Now, as many extractive matters are more or less volatile, it makes a great difference whether the operation is conducted at a low or at a high temperature. Extracts are called *watery* or *alcoholic* according as the menstruum employed is water or spirits. Ether also is used in extracting. Different plants afford different extracts, some being of the nature of bitters, others being used as pigments, tannin, etc. Extracts are liable to great uncertainty in point of strength and composition, and require to be prepared with great care. Evaporation in vacuo is found to be a great improvement.

EXTRADITION, n. *ĕks'tră-dĭsh'ŭn* [F. *extradition*—from L. *extradĭtĭōnem*—from *ex*, out of; *tradĭtĭō*, a delivering up, a surrender]: the delivering up by one government to another of any subject who has fled from justice. EXTRADITE, v. *ĕks'tră-dit*, to deliver up to one country by another, a subject of the former who is a fugitive from justice, generally according to treaty and under certain formalities. EX'TRADITING, imp. EX'TRADITED, pp. *-dī-tĕd*.—*Extradition* is always the subject of international treaty. A treaty or convention for this purpose was entered into between the United States and Great Britain 1842, and between Great Britain and France 1843. The crimes for which extradition from Great Britain is allowed were settled by the Extradition Act 1870, 33 and 34 Vict. c. 52, and include murder, manslaughter, spurious coining, forgery, larceny, false pretenses, bankruptcy offenses, rape, abduction, child-stealing, burglary, arson, robbery, threats to extort money, sinking of ships, revolt and assaults in ships; but there is no surrender if the offense is one of a political character. The surrender is effected through the intervention of the sec. of state, and it is by the secretary's warrant that the alleged criminal is finally handed over with the depositions to the foreign state making the requisition.

The practice of the United States government both as to demanding from, and surrendering fugitive criminals to, foreign governments is regulated entirely by treaty. The first general law on the subject was enacted by congress 1848, and recognizes this principle. The separate American states have no power to surrender fugitive criminals at the demand of a foreign government. They may and do surrender such criminals to each other. Many treaties have been made by the United States with foreign governments at different times, notably with Great Britain, 1842; France, 1843, 45, 58; Hawaiian Islands, 1849; Swiss Confederation, 1850; Prussia, 1852; Bremen, 1853; Bavaria, 1853; Wurtemberg, 1853; Mecklenburg-Schwerin, 1853; Mecklenburg-Strelitz, 1853; Oldenburg, 1853; Schaumburg-Lippe, 1854; Hanover, 1855; Two Sicilies, 1855; Austria, 1856; Baden, 1857; Sweden and Norway, 1860: Venezuela, 1860; Mexico, 1861; Hayti, 1864; Dominion Republic, 1867; Italy, 1868, 69; Nicaragua, 1870; Orange Free State, 1871; Ecuador, 1872. Treaty stipulations have been made also with Republic of Salvador, 1870; Peru, 1870; Ottoman Empire, 1874; Spain, 1877; Netherlands, 1880; Belgium, 1882. The extraditable crimes usually specified are: arson, assassination, assault with intent to commit murder, burglary, circulation or fabrication of counterfeit money; counterfeiting public bonds, bank bills, securities, stamps, dies, seals, and marks of state and administrative authority; embezzlement of public money, embezzlement by public officers, embezzlement by persons hired or salaried, utterance of forged paper, forgery, infanticide, kidnapping, larceny, murder, mutiny, mutilation, parricide, piracy, poisoning, rape, and robbery. Some treaties also include bigamy, fraudulent bankruptcy, fraudulent barratry, and intentional injuries to railroads and telegraph lines (Spear on *Extradition*).

EXTRADOS, n. *ĕks-trā'dŏs* [F. *extrados*—from L. *extra*, on the outside, and F. *dos;* L. *dorsum*, the back]: the exterior curve of an arch. EXTRA'DOSED, a. *-trā'dŏst*, in *arch.*, term applied to an arch when the curves of the intrados and extrados are concentric and parallel.

EXTRA-JUDICIAL, EXTRA-MUNDANE, EXTRA-MURAL, etc.: see under EXTRA.

EXTRANEOUS, a. *ĕks-tră'nĭ-ŭs* [L. *extrānĕŭs*, external, outward—from *extra*, without]: foreign; not belonging to a thing; without or beyond a thing. EXTRA'NEOUSLY, ad. *-lĭ*. EXTRANEITY, n. *ĕks'tră-nē'ĭ-tĭ*, state of being foreign; state of being without or beyond a thing. EXTRANEOUS MODULATION, n. *mŏd-ū-lā'shŭn*, in *mus.*, modulation to an extreme or unrelated key.

EXTRAORDINARY, a. *ĕks-trŏr'dĭ-nĕr-ĭ* or *ĕks'tră-ŏr'-dĭ-nĕr-ĭ* [F. *extraordinaire*—from L. *extrăŏrdĭnārĭŭs*, out of the common order—from *extra*, beyond; *ordo*, arrangement, order: It. *extraordinario*]: beyond ordinary or usual; uncommon; remarkable; special. EXTRAOR'DINARILY, ad. *-nĕr-ĭ-lĭ*, in a manner out of the common method and order; remarkably; in an uncommon degree. EXTRAOR'DINARIES, n. plu. *-nĕr-ĭz*, unusual things.

EXTRAUGHT, v. *ĕks trawt':* in *OE.*, the old pp. of *extract;* extracted; sprung from; descended.

EXTRAVAGANT, a. *ĕks-trăv'ă-gănt* [F. *extravagant*—from L. *extravăgăn'tem*—from L. *extra*, without or beyond; *vagans*, wandering—*lit.*, wandering out of proper bounds]: excessive; wasteful; unreasonable; vainly expensive; not within ordinary limits of truth or probability. Extrav'agantly, ad. *-lĭ.* Extrav'agance, n. *-găns* [F.—L.]: excess in anything; a going beyond the limits of strict truth or probability; also Extrav'agancy, n. *-sĭ.* Extrav'agants, n. plu. certain decretal epistles or constitutions of the popes. Extrav'agan'za, n. *-găn'ză* [It.]: an unusual or irregular piece of music; a burlesque on the stage. Extravagan'zist, n. *-zĭst*, extravagant or eccentric person; writer of extravaganzas.—Syn. of 'extravagance': excess; prodigality; wildness; irregularity; profusion; waste; dissipation; outrage; violence; bombast;—of 'extravagant': prodigal; lavish; profuse; irregular; unrestrained; wild; uncontrolled.

EXTRAVASATE, v. *ĕks-trăv'ă sāt* [F. *extravaser*—from L. *extra*, without, and *vas*, any kind of vessel]: to let or flow out of the proper vessels, as blood out of veins. Extrav'asating, imp. Extrav'asated, pp.: Adj. forced out of the arteries, veins, etc., as the blood by which the skin, is discolored in bruises. Extrav'asa'tion, n. *sā'shŭn* [F.—L.]: the act of flowing out of the proper ducts or vessels, through ruptures or injuries in their walls, as blood or any fluids of the living body, into the surrounding tissues; the effusion of the blood after the rupture of a vessel. Excrementitious matter thus sometimes escapes into the abdomen through a wound or ulceration of the bowels. But the term is oftenest used in speaking of the escape of blood from injured blood-vessels, Extravasation is distinguished from exudation by this, that in the last the vessels remain entire, and the effusion takes place by filtration through their walls; nor does more than a part of the blood so escape, the blood globules being retained, while in extravasation perfect blood is effused. Many kinds of extravasation are immediately fatal, such as that of urine or of gall into the abdomen, or of blood from the vessels of the brain in many cases of apoplexy. The dark color resulting from a bruise is owing to extravasated blood from ruptured capillary vessels.

EXTREAT, n. *ĕks-trēt'* [Norm. F. *estraite*]: in *OE.*, extraction.

EXTREME, a. *ĕks-trēm'* [F. *extrême*—from L. *extrēmus*, the outermost, last: It. *estremo*]: furthest; outermost; utmost; most violent; highest in degree; most pressing; rigorous; strict: N. that part which terminates; utmost point. Extremes', n. plu. *-trēmz'*, what are furthest distant from each other. Extreme'ly, ad. *-lĭ.* Extrem'ity, n. *-trĕm'ĭ-tĭ* [F. *extrémité*]: the utmost point; the verge; the greatest rigor or violence; necessity; the utmost distress. Extrem'ities, n. plu. *-tĭz*, the parts most remote from the middle; limbs as opposed to the trunk or head. Extreme

UNCTION: see UNCTION.—SYN. of 'extremity': border, extreme; termination; close; end; limit.

EXTREME UNCTION [see UNCTION]: sacrament of the Rom. Cath. Church, which, as the other sacraments supply spiritual aid in the various circumstances of life, is believed to impart to the Christian in death grace and strength to encounter the struggle, as well spiritual as bodily, of the dying hour. The rite of unction in different forms is common to several of the sacraments; the name 'extreme' given to that of the present sacrament, denotes that it is reserved for the last act of the Christian career. The council of Trent declares this sacrament, though 'promulgated' in the well known passage of St. James, v. 14, 15 (which Protestants regard as having more to do with the general belief in the sanative properties of oil), to have been 'instituted' by Christ. The Fathers frequently allude to the rite of unction, and though many of these allusions certainly refer to the unctions of baptism and confirmation, yet Rom. Catholics rely on several passages of Origen, Chrysostom, Cæsarius of Arles, and Pope Innocent I., as decisive regarding the unction of the dying, as also upon the fact that in the various separated churches of Oriental Christians—Greek, Coptic, Armenian, and Nestorian—the rite is found, though with many ceremonial variations. In the Rom. Cath. Church, the sacrament is administered by the priest, who, 'dipping his thumb in the holy oil, anoints the sick person, in the form of the cross, upon the eyes, ears, nose, mouth, hands, and feet; at each anointing making use of this form of prayer: "Through this holy unction, and his most tender mercy, may the Lord pardon thee whatever sins thou hast committed by thy sight. Amen." And so of the hearing and the rest, adapting the form to the several senses.'—Challoner's *Catholic Christian Instructed.* E. U. is reputed by Catholics one of the sacraments 'of the living;' that is, it ordinarily requires that the recipient should have previously obtained remission of his sins by absolution or by perfect contrition; but it is held to remit, *indirectly*, actual sins not previously remitted, and also (though not infallibly, but according to the merciful designs of Providence) to alleviate, and even to dispel, the pains of bodily disease. The holy oil which forms the 'matter' of this sacrament must be blessed by the bishop—a ceremony performed with great solemnity once each year by the bishop, attended by a number of priests, on Maundy-Thursday. In the Greek Church, the sacrament is administered by several priests conjointly. In its most solemn form, seven priests unite in its administration; in ordinary circumstances, it is conferred by two. The Greek form of words differs, though not substantially, from that of the Latin Church. The Greeks call this sacrament 'The Holy Oil,' and sometimes 'The Oil of Prayer.'

• EXTRICATE, v. *ĕks'trĭ-kāt* [L *extricātus,* disentangled—from *ex,* out of; *trīcæ,* trifles, hindrances]: to free from difficulties or perplexities; to disentangle; to set free. EX'TRICATING, imp. EX'TRICATED, pp. EX'TRICABLE, a. *-kă-bl,* that may be extricated. EX'TRICABLY, ad. *-blì* EX-TRICA'TION, n. *-kā'shŭn*, a freeing from perplexities; disentanglement.—SYN. of 'extricate': to disengage; relieve; set free; disembarrass; evolve.

EXTRINSIC, a. *ĕks-trĭn'sĭk*, or EXTRIN'SICAL, a. *-sĭ-kăl* [OF. *extrinseque*, outward—from L. *extrinsĕcus*, from without, on the outside—from *exter*, outward; *sĕcus*, by, beside, or simply 'side': F. *extrinsèque*]: without, but yet near to; external; outward; not contained in or belonging to a body. EXTRIN'SICALLY, ad. *-lĭ*.

EXTRORSE, a. *ĕks-trŏrs'*, or EXTROR'SAL, a. *-trŏr'săl* [L. *extra*, on the outside; *orsus*, beginning, commencing]: in *bot.*, applied to anthers in which the slit through which the pollen escapes is toward the outside of the flower, and not, as usual, toward the pistil.

EXTROVERSION, n. *ĕks-trō-vėr'shŭn* [L. *extra*, beyond, without; *versio*, a turning]: in *surg.*, turning of an organ inside out; as, for example, the bladder.

EXTRUDE, v. *ĕks-trôd'* [L. *extrūdĕrĕ*, to thrust out—from *ex*, out of; *trūdo*, I thrust: It. *estrudere*]: to thrust out; to expel; to force or press out. EXTRU'DING, imp. EXTRU'DED, pp. EXTRU'SION, n. *trô'zhŭn* [L. *extrūsŭs*, thrust out]: the act of thrusting or driving out; expulsion.

EXUBERANT, a. *ĕks-ū'bėr-ănt* [F. *exubérant;* L. *exūbĕran'tem*, being in great abundance—from *ex*, out of; *ūbĕr*, fruitful, fertile: It. *esuberante*]: plenteous in a high degree; luxuriant; over-abundant. EXU'BERANTLY, ad. *-lĭ*. EXU'BERANCE, n. *-ăns* [F.—L.]: or EXU'BERANCY, n. *-ăn-sĭ*, an overflowing quantity; superfluous abundance; richness; luxuriance.—SYN. of 'exuberance': excess; abundance; plenty; copiousness; rankness; overflow; overgrowth; wantonness; superfluity.

EXUCONTIANS, n. *ĕks-ū-kŏn'shĭ-anz* [Gr. *ex ouk ontōn*, from persons or things not existing]: Arian sect which arose in the 4th c. They held that Christ might indeed be called God, and the Word of God, but only in a sense consistent with his having been brought forth from non-existences, that is, that there was a time when he did not exist, and that consequently he was but a creature.

EXUDE, v. *ĕks-ūd'* [L. *exsūdārĕ*, to sweat out—from *ex*, out of; *sūdo*, I sweat]: to discharge the moisture or juices of an animal or a plant through its skin or surface; to flow from a living body through an opening or incision. EXU'DING, imp. EXU'DED, pp. EX'UDA'TION, n. *-ū dā'shŭn*, a discharge of moisture from animal bodies or from plants; that which has been exuded.

EXULT, v. *ĕgz-ŭlt'* [L. *exultārĕ*, to leap and frisk about—from *ex*, out of; *saltārĕ*, to leap or dance: It. *esultare*]: to leap or dance, as for joy; to rejoice exceedingly; to be glad above measure; to triumph. EXULT'ING, imp.: ADJ. rejoicing greatly. EXULT'ED, pp. EX'ULTA'TION, n. *-ŭl-tā'shŭn* [F.—L]: the act or state of rejoicing greatly; great gladness; triumph. EXUL'TANT, a. *-tănt*, rejoicing triumphantly. EXUL'TINGLY ad. *-lĭ*.

EXUMAS, *ĕks-ô'mâz:* comprising great Exuma, Little Exuma, and the Exuma Keys; part of the group of the Bahama Islands. The inhabitants are employed partly in agriculture, including at one time the growing of cotton, but chiefly in salt-making, in which the E. rank second among all the subdivisions of the group. They have exported as much as 116,000 bushels of salt a year. Next to Nassau in New Providence, Little Exuma is the most considerable port of entry in the Bahamas. Pop. of the group, abt. 2,000.

EXUSTION, n. *ĕks-ūst'yŭn* [L. *exŭstĭōnem*, a consuming by fire—from *ex*, out of; *ustus*, burnt]: the act of burning or consuming by fire.

EXUTORY, n. *ĕgz-ū'tė-rĭ* [L. *exutus*, pp of *exuo*, I lay or put off]: in *med.*, an issue; small ulcer produced artificially, and kept open for therapeutic purposes.

EXUVIÆ, n. plu. *ĕgz-ū'vĭ-ē* [L. *exŭvĭæ*, things laid aside or taken off from the body]: things of any kind cast off and left; cast off skins, shells, etc., of animals; in *geol.*, formerly all fossil animal matter or fragments of animals of any description, now seldom used in this sense. Exu'viable, a. *-ă-bl*, that may be cast or thrown off. Exu'via'tion, n. *-ā'shŭn*, the process by which animals, such as the crustaceans, serpents, etc., throw off their old coverings and assume new ones. Exutive, a. *ĕks ū-tĭv*, in *bot.*, applied to seeds wanting the usual integumentary coverings

EX VOTO, n. *ĕks vō'tō* [L. from, or in accordance with a vow]: something offered to some divinity either in gratitude for an exemplary favor, or to obtain such benefit. Roman *ex votos* consisted usually of paintings representing the particular danger from which the person had been delivered. Pictorial *ex votos* are common in Rom. Cath. churches in Europe, and as they are not of a high order of art, it is usual in the slang of the *ateliers*, to call a daub an ex voto. In the 5th c. it had become usual to offer gold and silver eyes to the saints in the churches, in acknowledgment of cures; and *ex votos* in the shape of pictures, models of diseased or wasted limbs, and even walking sticks and crutches may be seen suspended near the altars of the Virgin and the saints in many churches, notably at Notre Dame des Victoires, in Paris, and at Lourdes.

EYALET, *ā'yâ-lĕt*, or Vilayet, *vē-lâ-yĕt':* largest and most important class of the administrative divisions of the Turkish empire, formerly known as pashalics. These are again divided into *livas* or *sanjaks*, the livas into *cazas* or districts, and the cazas into *nahiés* or communes, containing villages and hamlets. Each eyalet or general government, as it may be called, is administered by a pasha, who is governor, and the general name for whom is *vali* or viceroy. The governors of the eyalets belong to the Dignities of the Sword, and are pashas of two tails; and when they are raised to the rank of vizier, as is frequently the case, they become pashas of three tails.

EYAS, n. *ī'ăs:* see under Eyrie.

EYCK, *īk*, HUBERT VAN: illustrious painter of the old Flemish school: abt. 1366–1426, Sep. 18; b. Maas-Eyck. Hubert, with his younger brother and pupil, Jan, resided chiefly at Bruges and Ghent, and they became the founders of the Flemish school of painting. Hubert is among the greatest names of the 15th c. in ecclesiastical art; certainly the greatest outside of Italy. Though lacking in scientific perspective, he commands admiration by his vigor of conception, his careful finish, and his clearness and richness of color. The honor of being the inventor of oil-painting is claimed for him, though sufficient evidence has been adduced to show that it was practiced previously. Before his time, the custom, however, particularly in Italy, was to paint with gums or other substances of an adhesive nature dissolved in water; and if not the inventors, the brothers were at least the first who brought into notice and perfected the mode of mixing colors with oil or some medium of which oil was the chief ingredient; while, for transparent and brilliant coloring and minute finish, their works have never been surpassed. Till the death of Hubert, the brothers generally painted in conjunction: one of their most important works was an altar-piece with folding-doors, representing the Elders adoring the Lamb--a subject from the Apocalypse —painted for *Jodocus Vyts,* who presented it to the cathedral of St. Bavon, in Ghent. The two central divisions of this picture are all that remain in the church at Ghent. Some of the wings are in the Gallery at Berlin. The masterpieces of the brothers are for the most part in the cities of Ghent, Bruges, Antwerp, Berlin, Munich, and Paris. See EYCK, JAN VAN.

EYCK, JAN VAN: illustrious painter of the old Flemish school: b. Maas-Eyck, 1370 (as some suppose, though Kugler—usually good authority on ancient art—dates his birth 1400); d. Bruges 1440–1; brother of Hubert. Jan, who had the advantage of his brother's teaching and experience, and besides had sojourned in sunnier southern lands, left work which cannot be called inferior to Hubert's —possibly superior in some points of graceful effect, while lacking something of the older brother's spiritual grandeur. In the National Gallery, London, there are three pictures by Jan van E., which, though small, well exemplify the high qualities of his works, and show him able to work fully in the spirit of his brother. These are portraits of a Flemish merchant and his wife, standing in the middle of an apartment, with their hands joined—signed and dated 1434: of the portrait of a man in a cloak and fur-collar, with a red handkerchief twisted around the head as a turban—painted, according to an inscription on the lower part of the frame, 1433, Oct. 21; and portrait of a man with a dark-red dress, with a green head-covering—signed and dated 1432, Oct. 10. Compare Waagen, *Ueber Hub. und Jan van Eyck* (Breslau, 1822); Hotho, *Die Malerschule E.'s* (1858). See EYCK, HUBERT VAN.

EYE, n. ī [AS. *eage;* Icel. *auga;* Goth. *augo;* Ger. *auge;* L. *ocŭlŭs,* the eye]: the organ of sight or vision; sight; view; notice; observation; a small loop or ring; a bud; a very small perforation: V. to watch or keep in view; to watch narrowly. EYING, imp. *ī'ĭng.* EYED, pp. *īd:* ADJ. having eyes. EYEN, or EYNE, n. *ī'n,* in *OE.*, eyes; the plu. of *eye.* EYER, n. *ī'ėr,* one who. EYE'LESS, a. without eyes. EYE-BEAM, n. a beam or glance of the eye. EYE-BOLT, n. in *naut.*, bolt having an eye or loop at one end for the reception of a ring, hook, or rope. The insertion of a closed ring into the eye converts it into a ring-bolt. EYE-CUP, n. cup for washing the eyeball. Its lip is held firmly against the open lid, and the eye-wash dashed against the ball, or forced against it by compressing the reservoir. EYE-DROP, n. a tear. EYE-FLOP, n. a blinker on a horse's bridle. EYE'FUL, a. filling or attracting the eye; visible; remarkable. EYE-GLASS, a single spectacle or prepared disk of glass to assist the sight. EYE-HEADED, a. having an eye or aperture in the head. A form of bolt having an eye at the head end; intended for securing together two objects at right-angles. EYE-HOLE, n. circular opening in a bar, etc., to receive a pin, hook, rope, or ring. EYE-SERVANT, one who works only when watched. EYE-SERVICE, service only under the eye of a master. EYE-STONE, a name given to those varieties of circle agate which show, in the centre, a spot or spots more highly colored than the concentric layers; name given to a small smooth stone still sometimes used for removal of foreign substances from the eye; it is inserted under the eye-lid, and moving with the motion of the eye, carries out the intruding fragment. EYE-TOOTH, one of the two pointed teeth of the upper jaw, one under each eye. EYE-WITNESS, one who sees the thing done; one who has seen. EYEBALL, the ball or apple of the eye. EYEBROW, n. the brow or hairy arch above the eye. EYELASH, n. the line of hair that edges the eye-lid. EYELET, n. *ī'lĕt,* or EYELET-HOLE [F. *œillet,* a little eye—from OF. *œil*—from L. *ocŭlŭs,* the eye]: a small hole or perforation to receive a lace or cord, also to admit light. EYELET-PUNCH, n. device used at the desk for attaching papers together by eyeleting. It has usually a hollow punch for making a hole, and a die-punch to upset the flange of the eyelet. EYELETEER', same as stiletto. EYELID, n. the movable cover which opens or closes the eyeball. EYE-PIECE, in a *telescope* or *microscope,* the lens or lenses with which the image is viewed and magnified (see TELESCOPE). EYE-RIM, n. circular single eye-glass, adapted to be held to its place by the construction of the orbital muscles. EYE-SALVE, ointment for the eyes. EYE-SHOT, a sudden glance of the eye; view. EYESIGHT, n. view; observation; the sense of seeing. EYESORE, n. something offensive to the sight. EYE-SPECULUM, n. instrument for dilating the eye-lids, to expose the exterior portions of the eye and its adjuncts. EYE-SPLICE, n. in *naut.*, a splice made by turning the end of a rope back on itself and splicing the end to the standing part, leaving a loop. EYE-SPOT, n. a kind of lily of a violet or black color, with a red spot in the middle of each leaf. EYE-STRINGS, n. the strings or tendons by which the eye is moved. EYED HAWKMOTH, in *entom.*, *Smerinthus ocellatus;* the *sphinx ocellata* of Linnæus: see HAWKMOTH. IN THE EYE OF THE WIND, in the position of direct opposition to it. TO HAVE AN EYE TO, to be on the lookout in a certain direction. TO KEEP AN EYE ON, to observe closely; to watch strictly. UNDER THE EYE, under close inspection or observation. WITH AN EYE TO, looking closely and narrowly towards a thing, particularly with a view to personal advantage. EYLIAD, n. *ī'lĭ-ăd* [F. *œillade,* a glance, a leer—from *œil,* the eye]: in *OE.*, a glance of the eye.

EYE, *ī,* (Aug. Sax. *ig.* 'an island'): market town apn municipal borough in Suffolk, Englnd, 20 m. n. of Ipswich. It has a fine perpendicular flint-work church (restored 1869), with a tower 101 ft. high, a corn exchange and town hall (1857), a grammar school (restored and enlarged, 1876–82), and a station at the terminus of a short branch railway. Pop. (1881) 2,296.

EYE, ANATOMY AND PHYSIOLOGY OF THE: including: 1. The structure of the human eyeball, and of certain accessory parts or appendages which serve to protect that organ, and are essential to the due performance of its functions. 2. The most striking modifications which this organ presents in some of the lower animals. 3. The special uses of the various parts of the eye considered as an optical instrument. 4. The action of the retina.

1. The *globe of the eye* is placed in the anterior part of the cavity of the Orbit (q. v.), in which it is held in position by its connection with the optic nerve posteriorly, and with the muscles which surround it, and by the eyelids in front. It is further supported behind and on the sides by a quantity of loose fat, which fills up all the interstices of the orbit, and facilitates the various movements of which the eye is capable.

The form of the eyeball is nearly spherical; but on viewing the organ in profile, we see that it is composed of segments of two spheres of different diameters. Of these, the anterior, formed by the transparent cornea, has the smaller diameter, and is therefore the most prominent; and hence the antero-posterior slightly exceeds (by about a line) the transverse diameter. The radius of the posterior or sclerotic segment is about $\frac{19}{40}$ths, and that of the anterior segment about $\frac{13}{40}$ths of an inch.

When the eyes are in repose, their antero-posterior axes are parallel; the optic nerves, on the other hand, diverge considerably from their commissure within the cavity of the skull to the point where they enter the globe; consequently, their direction does not coincide with that of the eye. Each nerve enters the back of the globe at a distance of about $\frac{1}{8}$th of an inch on the inner side of the antero-posterior axis of the eye.

The eyeball is composed of several investing membranes, and of certain transparent structures, which are inclosed within them, and which, together with the cornea (one of the membranes), act as refractive media of various densities upon the rays of light which enter the eye.

The outermost coat of the eye is the *sclerotic* (from *skleros,* hard). It is a strong, dense, white, fibrous structure, covering about four-fifths of the eyeball, and leaving a circular deficiency anteriorly, which is occupied by the cornea. Posteriorly, it is perforated by the optic nerve, and it is there continuous with the sheath which that nerve derives from the dura mater, the fibrous investment of the brain and spinal cord. Near the entrance of the nerve, its thickness is about $\frac{1}{20}$th of an inch; from this it diminishes to about $\frac{1}{40}$th; but in front it again becomes thicker, from the tendinous insertions of the straight muscles which blend with it. This coat, by its great strength and comparatively unyielding structure, maintains the inclosed parts in their proper form, and serves to protect them from external injuries.

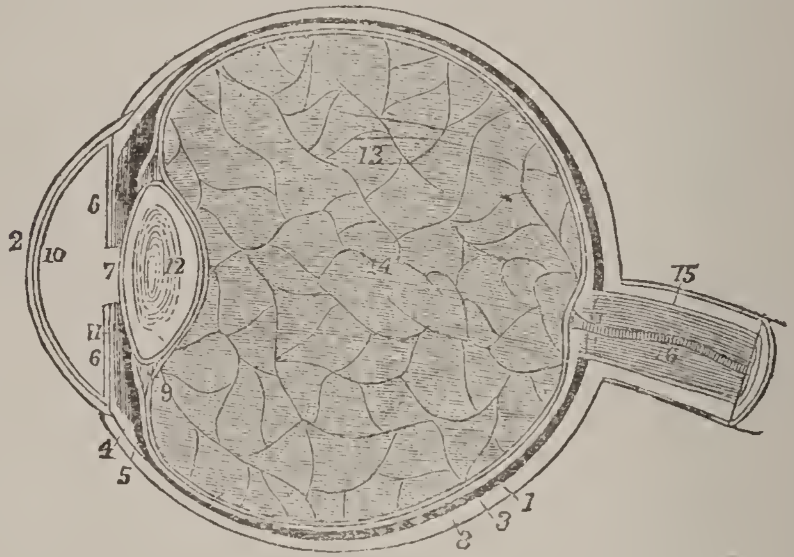


Fig. 1.

A longitudinal section of the coats of the eye.

1, the sclerotic, thicker behind than in front; 2, the cornea; 3, the choroid; 6, the iris; 7, the pupil; 8, the retina; 10, the anterior chamber of the eye; 11, the posterior chamber; 12, the crystalline lens, inclosed in its capsule; 13, the vitreous humor, inclosed in the hyaloid membrane, and in cells formed in its interior by that membrane; 15, the sheath; and 16, the interior of the optic nerve, in the centre of which is a small artery. (The other numbers in the figure refer to parts not noticed in this article)

The *cornea* (so called from its horny appearance) is a transparent structure, filling the aperture left in the anterior part of the sclerotic. Its circumference is overlaid by the free edge of the sclerotic, which in some parts presents a groove, so as to retain it more firmly; and the connection by continuity of texture between the two structures is so close, that they cannot be separated in the dead body without considerable maceration.

The cornea, in consequence of its greater convexity, projects beyond the line of the sclerotic; the degree of convexity, however, varies in different persons, and at different periods of life. It is thicker than any part of the sclerotic, and so strong as to be able to resist a force capable of rupturing that tunic.

Although beautifully transparent, and appearing to be homogeneous, it is in reality composed of five layers, clearly distinguishable from one another—viz. (proceeding from the front backward) 1. The conjunctival layer of epithelium It is in this epithelium that particles of iron, stone, etc., forcibly driven against the eye, usually lodge, and it is a highly sensitive membrane. 2. The anterior elastic lamina forming the anterior boundary of the cornea proper; it is not more than $\frac{1}{2000}$th of an inch in thickness; and its function seems to be that of maintaining the exact curvature of the front of the cornea. 3. The cornea proper, on which mainly the thickness and strength of the cornea depend. 4. The posterior elastic lamina, an extremely thin membrane, in which no structure can be detected. It probably contributes, like the anterior lamina, to the exact maintenance of the curvature of the cornea, so necessary for correct vison. 5. The posterior epithelium of the aqueus humor, probably concerned in the secretion of the fluid.

For further details regarding these different layers, see Tood and Bowman's *Physiological Anatomy*. II. pp. 17-21.

The *choroid coat* is a dark colored vascular membrane, brought into view on the removal of the selerotic. Its outer surface, nearly black, is loosely connected with the selerotic by connective tissue, in which are contained certain nerves and vessels—termed the ciliary nerves and vessels—which go to the iris. Its inner surface is soft, villous, and dark-colored. In front, it is attached to the membrane of the vitreous humor (see fig. 3) by means of the ciliary processes, which consists of about 60 to 70 radiating folds. These are alternately long and short, and each is termi-

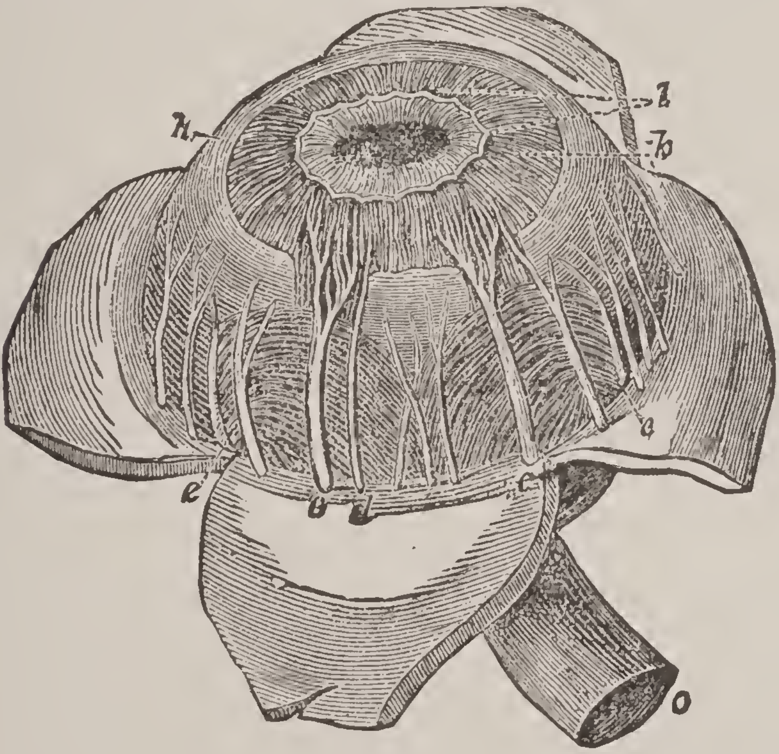


Fig. 2.

Choroid and iris, exposed by turning aside the selerotic.

c, ciliary nerves going to be distributed in iris: *d*, smaller ciliary nerves; *e*, *e*, veins known as vasa vorticosa; *h*, ciliary ligament and muscle; *k*, *l*, converging fibres of iris; *o*, optic nerve.

nated by a small free interior extremity; and they are lodged in corresponding folds in the membrane of the vitreous humor. In other parts, it is loosely connected with the retina. The choroid is composed of minute ramifications of vessels—especially of veins, which, from their whirl-like arrangement, are termed *vasa vorticosa*—of connective tissue, and of pigment cells, which usually approximate to the hexagonal form, and are about $\frac{1}{1000}$th of an inch in diameter. In albinos, this pigment is absent, and hence their eyes have a pink appearance, which is due to the unconcealed blood in the capillaries of the choroid and iris.

The *iris* may be regarded as a process of the choroid, with which it is continuous, though there are differences of structure in the two membranes. It is a thin flat membranous curtain, hanging vertically in the aqueous humor in front of the lens, and perforated by the pupil for the transmission of light. It divides the space between the cornea and the lens into an anterior (the larger) and a posterior (the smaller) chamber, these two chambers freely communicating through the pupil (see fig. 1). The outer and larger border is attached all round to the line of junction of the sclerotic and cornea, while the inner edge forms the boundary of the pupil, which is nearly circular, lies a little to the inner side of the centre of the iris, and varies in size according to the action of the muscular fibres of the iris, so as to admit more or less light into the interior of the eyeball; its diameter varying, under these circumstances, from about $\frac{1}{3}$d to $\frac{1}{20}$th of an inch. It is muscular in its structure, one set of fibres being arranged circularly round the pupil, and, when necessary, effecting its contraction, while another set lie in a radiating direction from within outward, and by their action dilate the pupil. These fibres are of the unstriped or involuntary variety.

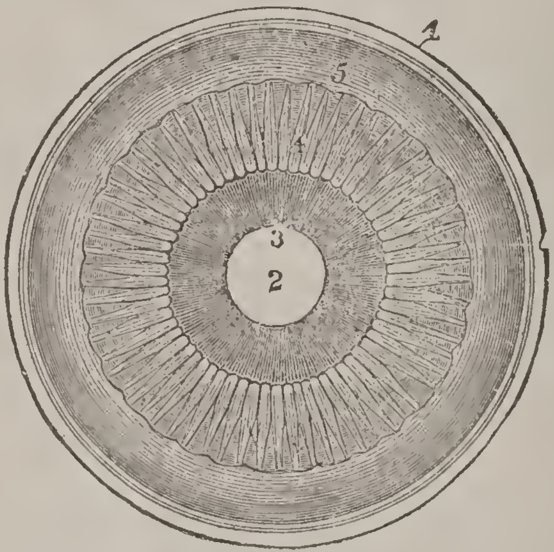


Fig. 3.

The iris and adjacent structures seen from behind.

1, the divided edge of the three coats, the choroid being the dark intermediate one; 2, the pupil; 3, the posterior surface of the iris; 4, the ciliary processes; 5, the scalloped anterior border of the retina.

The nerves concerned in these movements will be presently noticed.

The varieties of color in the eyes of different individuals, and of different kinds of animals, depend mainly on the color of the pigment deposited in cells in the substance of the iris.

Within the choroid is the *retina*, which, though continuous with the optic nerve—of which it is usually regarded as a cuplike expansion—differs very materially from it in structure. Before noticing the elaborate composition on this part of the eye, which has been revealed only by recent microcopical investigation, some points may be noted regarding it which can be established by ordinary examination. It is a delicate semi-transparent sheet of nervous matter, immediately behind the vitreous humor, and extending from the optic nerve nearly as far as the lens. On examining the concave inner surface of the retina at the back of the eye, we observe, directly in a line with the axis of the globe, a circular yellow spot (*limbus luteus*), of about $\frac{1}{20}$ of an inch in diameter, called, after its discoverer, the *yellow spot of Sömmering*. There has been much discussion regarding the structure and function of this spot: Dr. Todd and Mr. Bowman, two of the most eminent English microscopists, after several examinations, regard it as a small mound or projection of the retina toward the vitreous humor, with a minute aperture in the summit. The only mammals in which it exists are man and the monkey. Its use is unknown, but vision is remarkably perfect at this spot—a circumstance which, however, may possibly be accounted for by the fact that it is singularly free from blood-vessels, which curve round it and apparently avoid it.

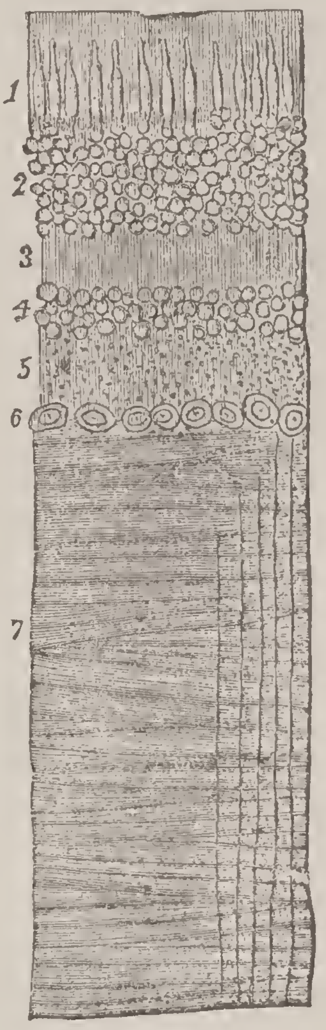


Fig. 4.

A vertical section of the human retina.

1, the layer of rods and cones (Jacob's membrane); 2, the external granular layer; 3, the intervening layer between 2 and 4, the internal granular layer; 5, finer granular layer; 6, layer of nerve-cells; 7, fibres of the optic nerve; 8, limitary membrane.

The structure of the retina, as revealed by the microscope, is in the highest degree remarkable. Although its greatest thickness (at the entrance of the optic nerve) is only about $\frac{1}{120}$ of an inch, and as it extends anteriorly, it soon diminishes to $\frac{1}{220}$ of an inch, the following layers from without inward may be distinguished in all parts of it: (1) The layer of rods and cones, frequently termed, from its discoverer, the *membrane of Jacob;* (2) The granular layer, including the parts indicated by 2, 3, 4, 5 in the figure; (3) The layer of gray nerve substance; (4) The expansion of the optic nerve; and (5) The limitary membrane. These various structures are shown in fig. 4, copied from Kölliker and Müller's memoir on the structure of the retina. Details regarding the nature of these various layers are given in Kölliker's *Manual of Human Histology*, and in Todd and Bowman, *op. cit.*

It now remains to describe the *transparent media* which occupy the interior of the globe, and through which the rays of light must pass before they can reach the retina, and form on it the images of external objects. We shall consider them in the order in which the rays of light strike them.

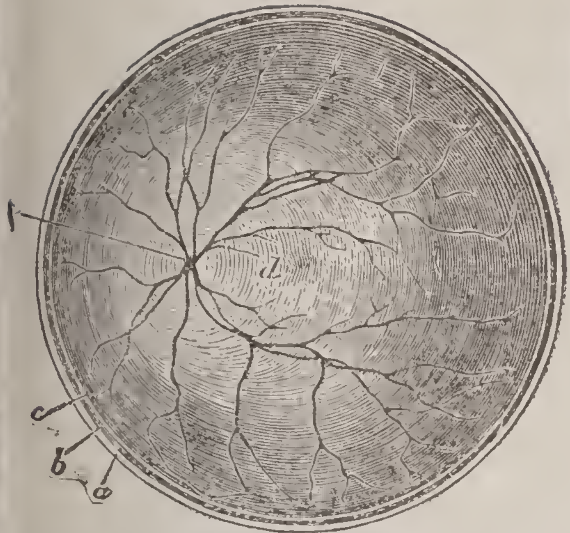
Immediately behind the transparent cornea is the *aqueous humor*, which fills the anterior and posterior chambers which lie between the cornea and the lens. As its name implies, it is very nearly pure water, with a mere trace of albumen and chloride of sodium. As no epithelium exists in front of the iris, or on the anterior surface of the lens, it is most probably secreted by the cells on the posterior surface of the cornea.

The *crystalline lens* lies opposite to and behind the pupil, almost close to the iris, and its posterior surface is received into a corresponding depression on the forepart of the vitreous humor (see fig. 1). In form, it is a double-convex lens, with surfaces of unequal curvature, the posterior being the most convex. It is inclosed in a transparent capsule, of which the part covering the anterior surface is nearly four times thicker than that at the posterior aspect, in consequence, doubtless, of greater strength being required in front, where there is no support, than behind, where the lens is adherent to the vitreous membrane. The microscopic examination of the substance or body of the lens reveals a structure of wonderful beauty. Its whole mass is composed of extremely minute elongated, ribbon-like structures, commonly called the *fibres of the lens*, regarded by Kölliker as *thin-walled tubes*, with clear, albuminous contents. These fibres are arranged side by side in lamellæ, of which many hundred exist in every lens, and which are so placed as to give to the anterior and posterior surfaces the appearance of a central star, with meridian lines.

The lens gradually increases in density, and, at the same time, in refracting power, toward the centre; by this means, the convergence of the central rays is increased, and they are brought to the same focus as the rays passing through the more circumferential portions of the lens. (According to Brewster, the refracting power at the surface is 1·3767, and at the centre 1·3990.)

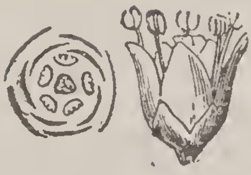
According to Berzelius, the lens contains 58 per cent. of water, 36 of albumen, with minute quantities of salts, membrane, etc. In consequence of the albumen, it becomes hard and opaque on boiling, as we familiarly see in the case of the eyes of boiled fish. In adult man, its long diameter ranges from $\frac{1}{3}$ to $\frac{3}{8}$, and its antero-posterior

PLATE 9.



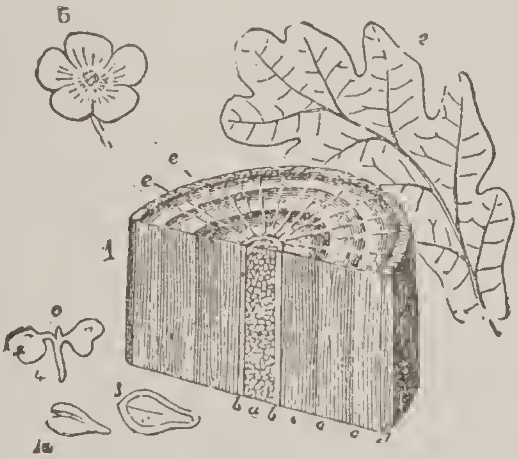
Posterior half of left **Eye** from the front: *a*, Cut edge of sclerotic; *b*, of choroid; *c*, of retina; *d*, Macula lutea; *e*, Optic disk or papilla.

Exorhizal Root.

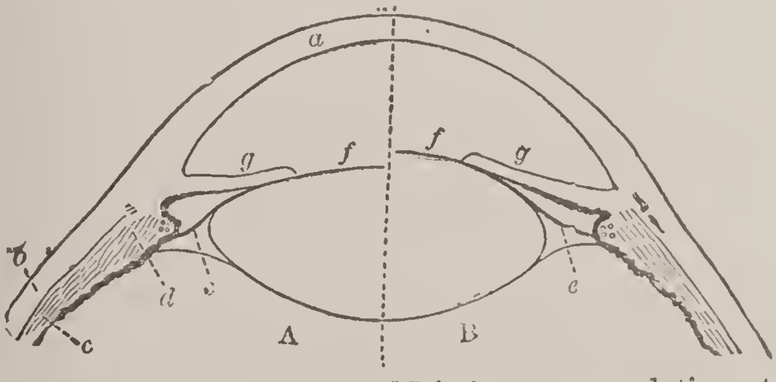


Extrorse Anthers of *Tamarix indica*.

Exostome and Endostome.



Exogen.—1, Section of a branch of three-years' growth: *a*, Medulla or pith; *b*, *b*, Medullary sheath; *e*, *e*, Medullary rays; *c*, *c*, Circles of annual growth; *d*, Bark. 2, Netted veined leaf (Oak). 3, Dicotyledonous seed: *a*, *a*, Cotyledons. 4, Germination of dicotyledonous seed: *a*, *a*, Seed-leaves or cotyledons; *o*, Plumula. 5, Exogenous flower (Crow-foot).



Eye.—Action of Ciliary Muscle and Iris in accommodation: A, (right or left) half; eye at rest, or focused for a distant object. B, (left or right) half; eye focused for a near object. *a*, Cornea; *b*, Sclerotic; *c*, Anterior part of choroid; *d*, Ciliary muscle; *e*, Suspensory ligament of lens; *f*, Anterior capsule of lens; *g*, Iris.

diameter from $\frac{1}{8}$ to $\frac{1}{6}$ of an inch; and it weighs three or four grains.

The *vitreous humor* lies in the concavity of the retina, and occupies about four-fifths of the eye posteriorly. Its form is shown in fig. 1. It is inclosed in the hyaloid membrane, which sends numerous processes inward, so as to divide the cavity into a series of compartments, and thus to equalize the pressure exerted by the inclosed soft gelatinous mass. Between the anterior border of the retina and the border of the lens, is a series of radiating folds or plaitings termed the *ciliary processes of the vitreous body*, into which the *ciliary processes of the choroid* dovetail. The vitreous humor contains, according to Berzelius, 98·4 per cent. of water, with a trace of albumen and salts, and hence, as might be expected, its refractive index is almost identical with that of water.

The appendages of the eye now claim notice. The most important of these appendages are the *muscles within the orbit*, the *eyelids*, the *lachrymal apparatus*, and the *conunctiva*, to which (though less important) may be added the *eyebrows*.

The *muscles* by which the eye is moved are four straight (or *recti*) muscles, and two oblique (the superior and inferior). The former arise from the margin of the optic foramen at the apex of the orbit, and are inserted into the sclerotic near the cornea, above, below, and on either side. The superior oblique arises with the straight muscles; but after running to the upper edge of the orbit, has its direction changed by a pulley, and proceeds backward, outward, and downward (see fig. 5). The inferior oblique arises from the lower part of the orbit, and passes backward, outward, and upward The action of the straight muscles is sufficiently obvious from their direction: when acting col-

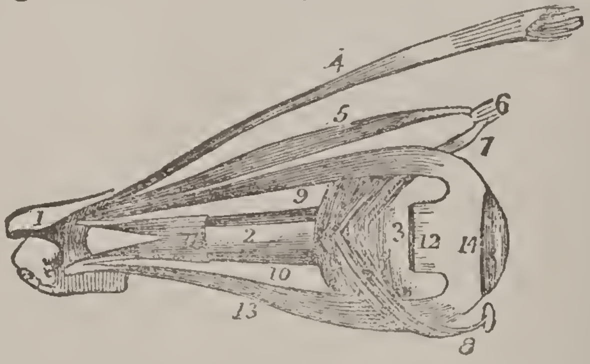


Fig. 5.

The muscles of the eyeball, the view being taken from the outer side of the right orbit.

1, a small fragment of the sphenoid bone at the back of the orbit, containing the foramen, through which, 2, the optic nerve passes; 3, the globe of the eye; 4, the levator palpebræ muscle; 5, the superior oblique muscle; 6, its cartilaginous pulley, attached to the upper edge of the orbit; 7, its reflected tendon; 8, the inferior oblique muscle, the little knob near the figure 8 being a detached fragment of the superior maxillary bone, from which it arises; 9, the superior rectus; 10, the internal rectus, partly concealed by the optic nerve; 11, 12, the two ends of the external rectus, the intermediate portion having been removed; 13, the inferior rectus; 14, the tunica albuginea, formed by the expansion of the tendons of the four recti muscles.

lectively, they fix and retract the eye; and when acting singly, they turn it toward their respective sides. The oblique muscles antagonize the recti, and draw the eye forward; the superior, acting above, directs the front of the eye downward and outward, and the inferior upward and inward. By the duly associated action of these muscles, the eye is enabled to move (within definite limits) in every direction.

The *eyelids* are two thin movable folds placed in front of the eye, to shield it from too strong light, and to protect its anterior surface. They are composed of (1) skin; (2) of a thin plate of fibro-cartilage, termed the tarsal cartilage, the inner surface of which is grooved by 30 or 40 parallel vertical lines, in which the Meibomian glands are imbedded; and (3) of a layer of mucous membrane, continuous as we shall presently see, with that which lines the nostrils, and which joins the skin at the margin of the lids, in which the eyelashes (*cilia*) are arranged in two or more rows. The upper lid is much the larger; and to the posterior border of its cartilage, a special muscle is attached, termed the *levator palpebræ superioris,* whose object is to elevate the lid, and thus open the eye; while there is another muscle, the *orbicularis palpebrarum,* which surrounds the orbit and eyelids; and by its contraction closes the eye. The Meibomian glands secrete a sebaceous matter, which facilitates the free motion of the lids, and prevents their adhesion. The eyelashes intercept the entrance of foreign particles directed against the eye, and assist in shading that organ from an excess of light.

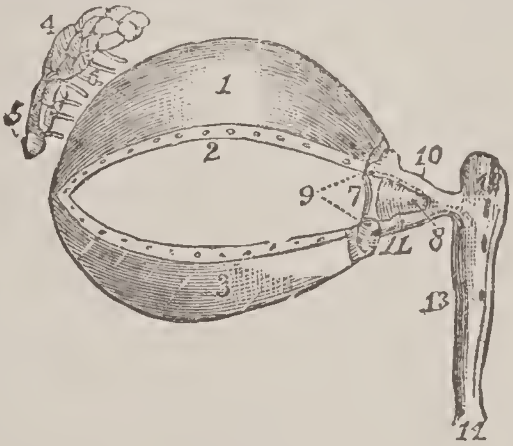


Fig. 6.

The appendages of the eye.

1, the cartilage of the upper eyelid; 2, its lower border, showing the openings of the Meibomian glands; 3, the cartilage of the lower eyelid, also showing on its border the openings of the Meibomian glands: 4, 5, the lachrymal gland; 6, its ducts; 7, the plica semilunaris; 8, the caruncula lachrymalis; 9, the puncta lachrymalia, opening into the lachrymal canals; 10, 11, the superior and inferior lachrymal canals; 12, the lachrymal sac; 13, the nasal duct, terminating at 14 in the lower meatus of the nose.

The *lachrymal apparatus* consists of the lachrymal gland, by which the tears are secreted; two canals, into which the tears are received near the inner angle of the eye; the sac, into which these canals open; and the duct, through which the tears pass from the sac into the nose. The gland is an oblong body, about the size of a small almond, lying in a depression in the upper and outer part of the orbit. The fluid secreted by it reaches the surface of the eye by seven or eight ducts, which open on the conjunctiva at its upper and outer part. The constant motion of the upper eyelid induces a continuous gentle current of tears over the surface, which carry away any foreign particle that may have been deposited on it. The fluid then passes through two small openings, termed the *puncta lachrymalia* (see 9 in fig. 6), into the canals; whence its further course into the lower portion of the nose is sufficiently obvious from the figure. The conjunctiva (or mucous coat) which covers the front of the eyeball, and lines the inner surface of the lids, passes down and lines the canals, sac, and duct; and is thus seen to be continuous with the nasal mucous membrane, of which it may be regarded as an offshoot or digital prolongation. See MUCOUS MEMBRANES.

The *nerves* going to this organ and its appendages in the human eye, remain to be noticed.

Into each orbit there enters a nerve of *special sense*—viz., the optic nerve, a nerve of *ordinary sensation*—viz., the ophthalmic branch of the fifth nerve, and certain nerves of *motion* going to the muscular tissues, and regulating the movements of the various parts—viz., the third, fourth, and sixth nerves.

For the optic tracts from which the *optic nerves* originate, see BRAIN: here these nerves are merely traced from their *chiasma* or commissure forward. This commissure results from the junction of the optic tracts of the two sides; and it is especially remarkable for the fact, that it presents a partial decussation of the nervous fibres; the central fibres of each tract passing into the nerve of the *opposite* side, and crossing the corresponding fibres of the other tract, while the outermost fibres, which are much fewer in number than the central ones, pass to the optic nerve of the *same* side. In front of the commissure, the nerves enter the optic foramen at the apex of the orbit, receive a sheath or investment from the *dura mater*, acquire increased firmness, and finally terminate in the retina.

The peculiar mode of termination of the optic nerves in the cuplike expansion of the retina, the impairment or loss of vision which follows any morbid affection of them, and the constant relation in size which is observed in comparative anatomy between them and the organs of vision, afford sufficient evidence that they are the proper conductors of visual impressions to the sensorium.

The first or ophthalmic division of the fifth or trifacial nerve sends branches to the skin of the eyelids and to the conjunctiva. That it is the nerve of ordinary sensation of the eye, is obvious from the following facts: (1) That in disease of this nerve in the human subject, it is not uncommon to find the eyeball totally insensible to every kind of stimulus (particles of dust, pungent vapors, etc.); and (2) that if the nerve be divided in the cranium (in one of the lower animals), similar insensibility results.

The most important of the nerves of motion of the eye is the third nerve, or *motor oculi.* It supplies with motor power the elevator of the upper eyelid, and all the muscles of the globe, except the superior oblique and the external straight muscle, and, in addition to this, it sends filaments to the iris and other muscular fibres within the eye. The application of an irritant (in vivisection experiments) to its trunk induces convulsive contraction of the principal muscles of the ball and of the iris; while division of the trunk ocacsions an external squint, with palsy of the upper eyelid and fixed dilatation of the pupil. The squint is caused by the action of the external straight and the superior oblique muscles, while the other muscles are paralyzed by the operation. The normal motor action of the nerve upon the iris, in causing contraction of the pupil, is excited through the optic nerve, and affords a good illustration of *Reflex Action* (q.v.); the stimulus of light falling upon the retina, and, through it, exciting that portion of the brain from which the third nerve takes its origin. This nerve clearly exerts a double influence in relation to vision: (1) it mainly controls the movements of the eyeball and the upper eyelid; and (2) from its connection with the muscular structures in the interior, it regulates the amount of light that can enter the pupil, and probably takes part in the adjusting power of the eye to various distances.

The fourth nerve supplies the superior oblique muscle with motor power, while the sixth nerve similarly regulates the movements of the external straight muscle—the only two muscles in the orbit which are not supplied by the third pair.

Although not entitled to be termed a nerve of the orbit, the facial nerve deserves mention as sending a motor branch to the *orbicularis* muscle, by which the eye is closed.

2. *Comparative Anatomy of the Eye.*—In *mammals,* the structure of the eye is usually almost indentical with that of man. The organ is, however, occasionally modified, to meet the peculiar wants of the animal. Thus, in the Cetacea, and in the amphibious Carnivora that catch their prey in the water, the shape of the lens is nearly spherical, as in fishes, and there is a similar thickening of the posterior part of the sclerotic, so as to thrust the retina sufficiently forward to receive the image formed by such a lens. (See the subsequent remarks on the eyes of fishes.) Again, instead of the dark-brown or black pigment which lines the human choroid, a pigment of a brilliant metallic lustre is secreted in many of the carnivora, forming the so-called *tapetum lucidum* at the bottom of the eyeball, which seems (according to Bowman) to act as a concave reflector, causing the rays of light to traverse the retina a second time, and thus probably increasing the visual power, particularly where only a feeble light is admitted to the eye. The pupil, moreover, varies in form, being transversely oblong in the Ruminants and many other Herbivora, and vertically oblong in the smaller genera of Cats. These shapes are apparently connected with the positions in which the different animals look for their food. Lastly, in some mammals (for example, the horse), there is a rudi-

mentary third eyelid, corresponding to the *membrana nictitans* of birds.

In *birds*, the eye, though presenting the same general composition as in man, differs from the mammalian eye, in several important points. From our knowledge of the habits of birds (especially birds of prey), we should naturally expect that from their rapid movements they should be able readily to alter the focus between the extremes of long and short sighted vision, and the modifications now to be mentioned clearly have this object in view.

In reference to the figure, which represents a section of the eye of the owl, we see (1) that the shape of the organ is not spherical, as in mammals, nor flattened anteriorly, as in fishes and aquatic reptiles, but that the cornea is very prominent, and the antero-posterior diameter lengthened; the consequence of this arrangement being to allow room for a large quantity of aqueous humor, and to increase the distance between the lens and the posterior part of the retina, and thus to produce a greater convergence of the rays of light, by which the animal is enabled to discern near objects, and to see with a faint light. In order to retain this elongated form, we find a series of bony plates, forming a broad zone, extending backward from the margin of the cornea, and lying embedded in the sclerotic. The edges of the pieces forming this bony zone overlap each other, and are slightly movable, and hence, when they are compressed by the action of the muscles of the ball, there is protrusion of the aqueous humor and of the cornea, adapting the eye for near vision; while relaxation of the muscles induces a corresponding recession of the humor and flattening of the cornea, and fits the eye for distant vision. The focal distance is regulated further by a highly vascular organ called the *marsupium* or, *pecten* lodged in the posterior part of the vitreous humor (fig. 7, *a*). It is attached to the optic nerve at the point where it expands into the retina, and seems endowed with a power of dilatation and contraction; as it enlarges, from distension of its blood-vessels, it causes the vitreous humor to push the lens forward, while, as it collapses, the lens falls backward again toward the retina.

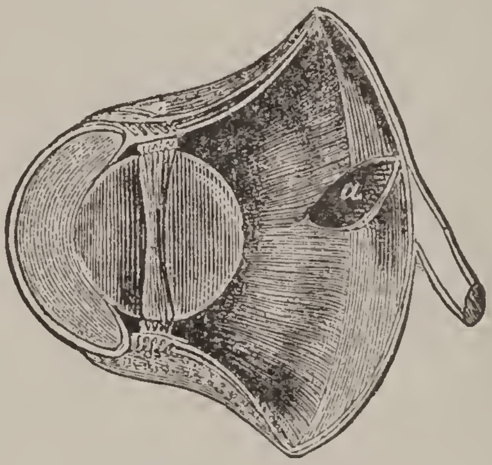


Fig. 7.—Eye of Bird.

In addition to an upper and lower eyelid, birds have an elastic fold of conjunctiva, which, in a state of repose, lies in the inner angle of the eye, but is movable by two distinct muscles, which draw it over the cornea. It is termed the *membrana nictitans*; it is to a certain degree transparent, for (according to Cuvier), birds sometimes look through it, as, for example, the eagle when looking at the sun. The lachrymal gland is situated as in mammals, but there is here a second gland, the *glandula Harderi,* which yields a lubricating secretion.

There are no very special peculiarities in the eyes of *reptiles,* and we therefore proceed to notice the most remarkable points presented by the eye in *fishes.* From the comparatively great density of the medium (water) through which the rays of light pass before they impinge upon the transparent structure of the eye of a fish, it is obvious that this organ must act as a very powerful refractive apparatus. The main peculiarity in the eye of the fish is the size, extreme density, and spherical shape of the lens, which give it such an extraordinary magnifying power that it has been employed as a simple microscope. See Brewster's *Treatise on the Microscope,* p. 31. But its focus being shortened in proportion as its power is increased, it is necessary that the retina should be brought near its posterior surface. For this purpose, the eyeball is flattened by diminishing the quantity of vitreous humor which, being of nearly the same density as the external water, exerts no perceptible power in bringing the rays of light toward a focus; and this flattened form is maintained by the existence of two cartilaginous plates in the tissue of the sclerotic, which in some of the larger fishes is actually converted into a bony cup. The aqueous humor having here no refractive power, is barely sufficient to allow the free suspension of the iris. The pupil is very large, so as to take in as much light as possible, but is generally motionless. Their eyes being constantly washed by the water in which they live, no lachrymal apparatus is necessary, nor does any exist; and the same remark applies to the *cetacea* amongst the mammals. Thus throughout the sub-kingdom of the

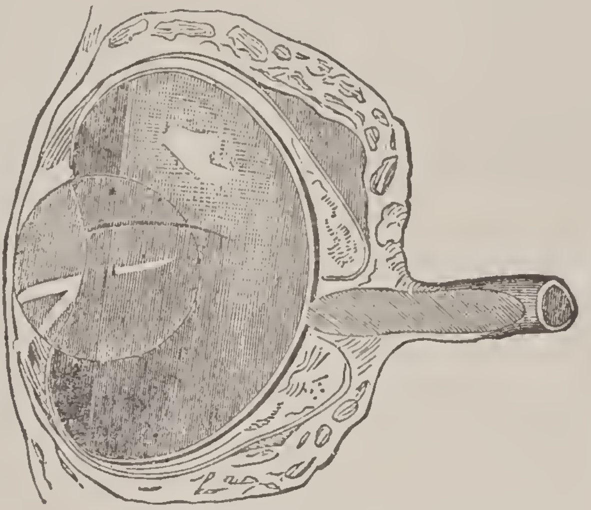


Fig. 8—Eye of Fish.

vertebrata the eye is constructed according to one general scheme, with modifications to suit the mode of life of individual classes.

In all the above cases, the structure of the eye is essentially the same; that is, there are certain dioptric media for collecting the divergent rays to their proper focus on the retina, and there are the means of adjusting the eye for different distances. But if we examine the eyes of insects, we find that they are constructed on different principles.

In these animals, we have *simple* and *compound* eyes usually associated in the same individual. The simple eyes resemble in many respects the corresponding organs in higher animals, but the compound eyes are extremely elaborate and complex in their structure. They are two in number, appearing as hemispherical masses on the sides of the head. When examined with the microscope, their surface is seen to be divided into an enormous number of hexagonal facets, which are in fact corneæ. In the ant, there are only 50 of these facets in each eye; in the common house-fly, 4,000; in butterflies, upward of 17,000; and in some of the beetles more than 25,000. Each cornea is found to belong to a distinct eye, provided with a nervous apparatus, and exhibiting a lens, iris, and pupil. Strauss Durckheim, who has carefully studied these structures in the cockchafer, suggests that, the eyes of insects being fixed, nature has made up for their want of mobility by their number, and by turning them in all directions; so that it might be said that these little animals have a distinct eye for every object.

Compound eyes of similar structure occur in many of the crustaceans.

3. Having now described the anatomical structure of the eye in man and certain of the lower animals, we are able to proceed to the consideration of the uses of the various parts of this organ. Assuming a general knowledge of the ordinary laws of geometrical optics (see DIOPTRICS: LENS: ETC.), we will trace the course of the rays of light proceeding from any luminous body through the different media on which they impinge. If a luminous object, for example, a lighted candle, be placed at about the ordinary distance of distinct vision (about ten inches) from the front of the eye, some rays fall on the sclerotic, and being reflected, take no part in vision; the more central ones fall upon the cornea, and of these some also are reflected, giving to the surface of the eye its beautiful glistening appearance; while others pass through it, are converged by it and enter the aqueous humor, which exerts no perceptible effect on their direction. Those which fall on and pass through the outer or circumferential part of the cornea are stopped by the iris, and are either reflected or absorbed by it; while those which fall upon its more central part pass through the pupil, and are concerned in vision. In consequence of its refractive power, the rays passing through a comparatively large surface of the cornea are converged so as to pass through the relatively small pupil and impinge upon

the lens, which, by the convexity of its surface, and by its greater density toward the centre, very much increases the convergence of the rays passing through it. They then traverse the vitreous humor, whose principal use appears to be to afford support to the expanded retina, and are brought to a focus upon that tunic, forming there an exact but inverted image of the object.

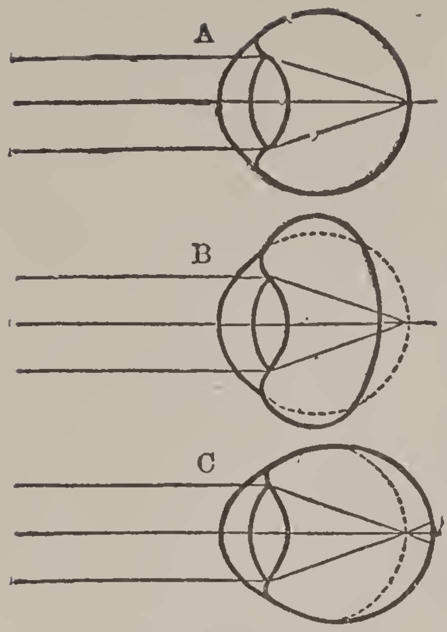
This inversion of the image may be easily exhibited in the eye of a white rabbit or other albino animal, after removing the muscles, etc., from the back part of the globe. The flame of a candle held before the cornea may be seen inverted at the back of the eye increasing in size as the candle is brought near, diminishing as it retires, and always moving in a direction opposite to that of the flame.

The adaptation of the eye to distinct vision at every distance beyond that of a few inches, is extremely remarkable, and numerous attempts have been made to explain the mechanism by which its focal length admits of alteration under the influence of the will. One view that has met with much support is, that the focal length is modified by a slight movement of the lens. In the eye of the bird there is a structure called the *ciliary muscle* which obviously approximates the lens to the cornea when a short field of view is required, and though the corresponding structure is only slightly developed in man and mammals, it is probably sufficiently strong to produce the slight action required; while for the vision of distant objects the lens is carried back toward the retina by the elasticity of the connecting tissues. It appears, however, from recent researches of Cramer, Helmholtz, Allen Thomson, and others, that the accommodation is effected rather by a change in the *form* than in the *position* of the lens. It has been experimentally proved, that when the eye is turned from a distant to a near object, the antero-posterior diameter of the lens becomes elongated, and the anterior surface becomes more convex, while the opposite changes take place in turning the eye from a near to a distant object. According to Helmholtz, the radius of curvature of the anterior surface of the lens diminishes on turning the eye to a near object from ten to six millimetres (from about 0·4 to 0 24 of an inch), while the most projecting point of the same surface is brought forward about 0·2 of an inch.

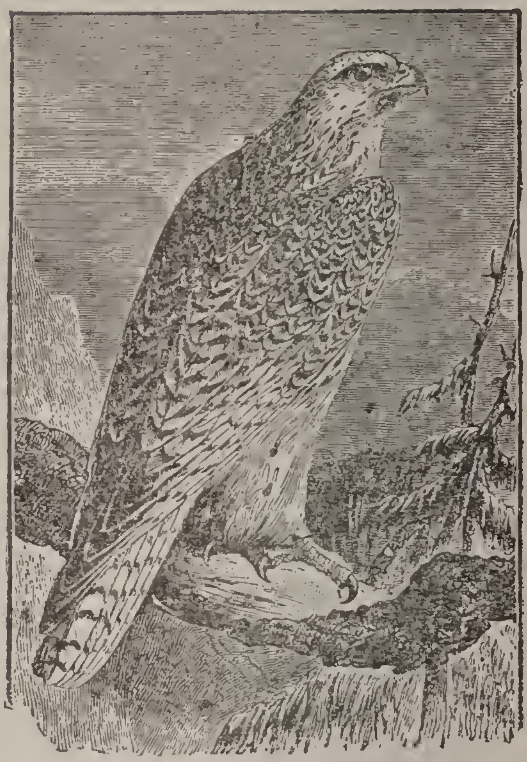
Whichever view be adopted, the ciliary muscle takes an active part in the process. According to the observations of Hueck, the focal distance may be changed about three times in a second. The accommodation from a near to a distant object is effected much more rapidly than the converse process.

There are two well-known forms of defective vision in which this power of adaptation is very much limited—viz., short-sightedness or *myopia*, and long-sightedness or *presbyopia*. The limitation, however, is due not to a defect in the muscular apparatus to which we have referred, but to an abnormality either in the curves or in the density of the refracting media. In *short-sightedness* from too great a re

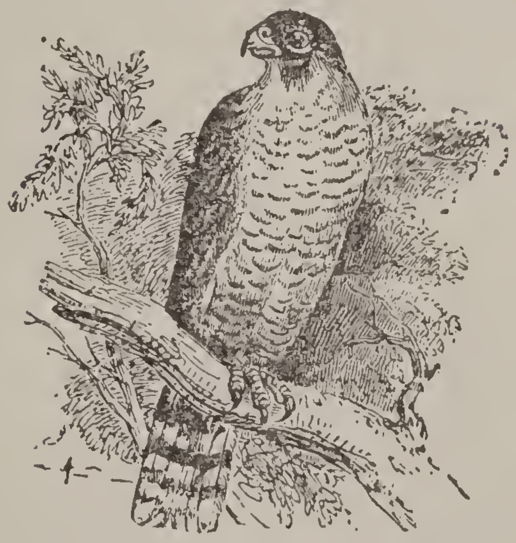
PLATE 10.



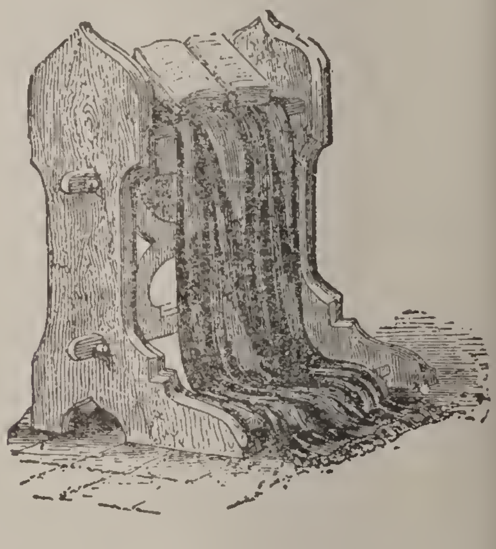
A, Normal eye: parallel rays brought to a focus at retina. B, Hypermetropic eye: globe shortened; parallel rays not yet brought to a focus when they reach retina. C, Myopic eye: globe lengthened; parallel rays brought to a focus in front of retina.



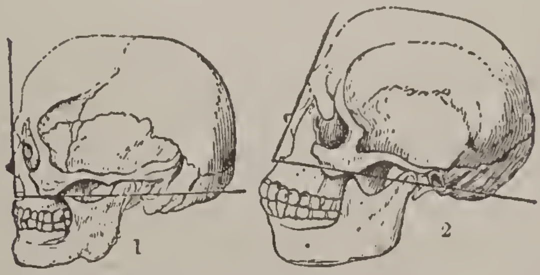
Greenland **Falcon** (*Falco candican*



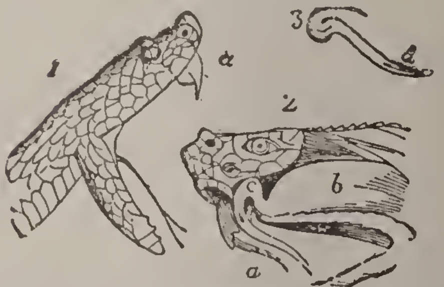
Peregrine **Falcon** (*Falco peregrinus*).



Faldstool.



Facial Angle: 1, European; 2, Negro.



Fangs of Serpent: 1, Head of Common Viper (*Pelias Berus*): *a*, Poison-fang. 2, Head of Rattlesnake cut open: *a*, Poison-fang; *b*, Poison-bag; *c*, Tube which conveys the poison to the fangs. 3, Fang, showing the slit (*d*) through which the poison is communicated to the wound.

fractive power from either cause, the rays from objects at the ordinary range of distinct vision are brought too soon to a focus, so as to cross one another, and begin to diverge before they fall on the retina; the eye in this case being able to bring to the proper focus on the retina only those rays which were previously diverging at a large angle from a very near object. The correction for this deficiency is accomplished by interposing between the eye and indistinctly-seen objects a *concave* lens, with a curvature just sufficient to throw the images of external objects at the ordinary distance of distinct vision backward, upon the retina. In *long-sightedness*, on the other hand, there is an abnormal diminution of the refractive power from too flat a cornea, a deficient aqueous humor, or a flattening of the lens, so that the focus is behind the retina. This defect is corrected by *convex* lenses, which increase the convergence of the rays of light. Long-sightedness, as its name *presbyopia* indicates, usually comes on at a comparatively advanced period of life, while short-sightedness is most frequent in young persons; but both these rules present occasional exceptions; and the common belief that the latter affection naturally disappears after the middle period of life, is altogether erroneous.

We have already noticed the most essential use of the iris —viz., its power, under the influence of light upon the retina, of modifying the size of the pupil, so as to regulate the amount of light entering the eye. But this is not its only use; one of its offices being to prevent the passage of rays through the circumferential part of the lens, and thus to obviate the indistinctness of vision which would arise from *spherical aberration* (the unequal refraction of the rays passing through the centre and near the margin of the lens), in the same manner as the diaphragms employed by the optician. But there are additionally two other means by which this spherical aberration is prevented, which well illustrate the wondrous mechanism of the eye. They are described by Prof. Wharton Jones as follows:

(1.) 'The surfaces of the dioptric parts of the eye are not spherical, but those of the cornea and posterior surface of the lens are hyperbolical, and that of the anterior surface of the lens elliptical—configurations found by theory fitted to prevent spherical aberration. This discovery was made at a time when it was not known but that the dioptric parts of the eye had spherical surfaces.

(2.) 'The density of the lens diminishing [as above shown] from the centre to its periphery the circumferential rays are less refracted than they would have been by a homogeneous lens with similar surfaces. This elegantly simple contrivance has been hitherto inimitable by human art.'—*The Actonian Prize Treatise*, 1851, p. 50.

Chromatic aberration, caused by the unequal refrangibility of the primitive rays of which white light is composed, when transmitted through an ordinary lens, whereby colored fringes are produced, is *practically* corrected in the eye, though it is doubtful whether it is *entirely* absent. The provision, however, on which the achromatism depends has not been determined with certainty, probably because we do not yet know the relative refractive and dispersive powers of the cornea and humors of the eye. Sir David Brewster denies that the chromatic aberration receives any correction in the eye, and maintains that it is imperceptible only in consequence of its being extremely slight.

4. We have hitherto been considering the eye as an optical instrument which projects pictures of external objects on the retina; we now come to the action of the nervous tunic, the *retina*, and its adaptation to the physical construction of the eye.

When the retina or the optic nerve is stimulated, we have the sensation of light, whatever may be the nature of the stimulus employed—as, for example, if it be a blow on the eye in the dark, or irritation of the optic nerve from some morbid condition. The sensation of light, then, consists in a recognition by the mind of a certain condition of these nervous structures, and this condition may be induced by the application of any stimulus; the ordinary stimulus obviously being the rays of light which fall upon the retina. There must, however, be a certain amount of light for the purpose of vision. It is difficult and painful to discern objects in a very faint light; but on the other hand, on suddenly entering from the dark into a brilliantly lighted room, everything appears confused for one or two seconds. There is, however, a gradual adaptation of the retina to different amounts of light. Persons long immured in dark dungeons acquire the power of distinctly seeing surrounding objects; while those who suddenly encounter a strong light, are unable to see distinctly until the shock which the retina has experienced has subsided, and the iris has duly contracted. In protecting the retina from the sudden effects of too strong a light, the iris is assisted by the eyelids, the orbicular muscle, and, to a certain extent, by the eyebrows. Moreover, the dark pigment of the choroid coat acts as a permanent guard to the retina, and where it is deficient, as in albinos, an ordinary light becomes painful, and the protective appendages, especially the eyelids, are in constant use.

The persistence, during a certain time, of impressions made on the retina, facilitates the exercise of sight. A momentary impression of moderate intensity continues for a fraction of a second; but if the impression be made for a considerable time, it endures for a longer period after the removal of the object. Thus, a burning stick, moved rapidly in a circle before the eyes, gives the appearance of a continuous ribbon of light, because the impression made by it at any one point of its course remains on the retina until it again reaches that point. It is owing to this property that the rapid and involuntary act of winking does not interfere with the continuous vision of surrounding objects; and, to give another illustration of its use, if we did not possess it, the act of reading would be a far more difficult performance than it now is, for we should require to keep the eye fixed on each word for a longer period, otherwise the mind would fail fully to perceive it. Again, in consequence of the retention of sensations by the retina, the image of an object may continue to be seen, especially in certain morbid states of the system, and in twilight, for some seconds after the eyes have been turned away from it, and this physiological phenomenon has probably given origin to many stories of ghosts and visions. Thus, if a person has unconsciously fixed his eyes, especially in the dusk, on a dark post or stump of a tree, he may, on looking toward the gray sky, see projected there a gigantic white image of the object, which may readily be mistaken for a supernatural appearance. These ocular spectra are always of the complementary color to that of the object. Thus, the spectrum left by a red spot is green; by a violet spot, yellow; and by a blue spot, orange. However great may be the velocity of a luminous body, it can always be seen; but if an opaque body move with such rapidity as to pass through a space equal to its own diameter in a less time than that of the duration of the retinal impression, it is altogether invisible; and hence it is, for example, that we cannot see bullets, etc., in the rapid part of their flight.

A small portion of the retina, corresponding to the entrance of the optic nerve, is incapable of exciting the sensation of vision when it receives the image of an object. According to Volkmann, this small spot exactly corresponds in size with the artery lying in the centre of the optic nerve. If the 'blind spot' had been situated in the axis of the eye, a blank space would always have existed in the centre of the field of vision, since the axis of the eyes in vision correspond. But as it is, the blind spots do not correspond when the eyes are directed to the same object. hence the blank which one eye would present is filled up by the other eye. Mariotte, early in the last century, first described the existence of these blind spots. Any one may satisfy himself of their existence by the following simple experiment. Let two small black circles be made upon a piece of paper, about four or five inches apart, then let the left eye be closed, and the right eye be strongly fixed upon the left-hand circle. If the paper be then moved backward and forward, a point will be found at which the right-hand circle is no longer visible, though it reappears when the paper is either brought nearer or removed further. Although no other part of the retina possesses the complete insensibility presented by the blind spot it is probable that its anterior portions have very little to do with vision. When using only one eye, we direct it toward the object we wish to inspect, in such a way as to throw the image to the back of the globe; and when the eye is thus fixed, objects near the boundary of the field of vision are less distinctly seen than those at its centre.

The extent of the field of vision for a single eye, the head being fixed, has been calculated by Dr. Young. He found that the eyeball was capable of a movement of 55 degrees in every direction, so that a single eye may have perfect vision of any point within a range of 110 degrees.

We have not yet referred to the longitudinal range, or greatest distance of human vision; indeed, this range varies so extremely that it is difficult to assign an arbitrary limit to it. Many uncivilized races, as the N. America Indians, and the inhabitants of the vast Asiatic steppes, possess powers of sight which would be almost incredible if they had not been thoroughly and frequently corroborated. Our information is more definite regarding the limits of human vision in regard to the minuteness of the objects of which it can take cognizance. Ehrenberg has carefully studied this subject, and has arrived at the following results. The side of the smallest square magnitude usually visible to the naked eye—either of white particles on a black ground or conversely—is about $\frac{1}{405}$th of an inch; and with the greatest condensation of light and effort on the part of the observer, squares with a side as small as $\frac{1}{540}$th of an inch *may* be recognized, but without sharpness or certainty. Bodies smaller than these, when observed singly, cannot be discerned by the *naked* eye, but may be seen when placed in a row. Much smaller particles may, however, be distinctly seen, if they powerfully reflect light, thus, gold-dust, which in none of its diameters exceeded $\frac{1}{1125}$th of an inch, is easily discernible in common daylight. The delicacy of vision is far greater for lines than for minute areas, since opaque threads of $\frac{1}{4900}$th of an inch may be discerned when held toward the light.

For various topics, such, for instance, as 'single vision with two eyes,' 'the appreciation of solid forms by the sense of vision,' 'correct vision with an inverted image on the retina,' etc., which belong as much to metaphysics as to physiology, see VISION: also Prof. Bain's treatise on *The Senses and the Intellect.*

EYE, DISEASES OF THE: very numerous and various, partly from the variety of the tissues and parts of which it is formed, partly because the exposed situation and transparency of the eye enable the diseases to be seen Nearly all its parts are liable to inflammation and its consequences: see OPHTHALMIA. The eyelids are liable to various diseases, as growths of several kinds, most of which the surgeon may remove; inflammation, as blear-eye (ophthalmia tarsi); to be misdirected inward or outward, *Entropium* and *Ectropium* (q.v.); and the upper eyelid may fall down (ptosis) from palsy of the common motor oculi nerve. The eyelashes may grow in upon the eye (trichiasis), and produce serious results. When plucked out they grow again; and if they still grow in upon the eye after this palliative treatment has been tried several times, the surgeon has to cut down on their roots, and destroy them. The duct which conveys away the tears to the nose is liable to inflammation and obstruction, causing watery eye: see LACHRYMAL ORGANS. The cornea is liable to opacity in various degrees. The mere *nebula* or cloudy condition, either limited or general, may pass off, and leave the cornea again clear; but the white mark, which is the cicatrix or scar of an ulcer, is permanent, though it may become smaller by the disappearance of the surrounding haze. The pupil may be closed as the result of iritis, or of operations for cataract, and an artificial pupil may be made by either of the three methods—incision, excision, or separation—but the operation is seldom successful. For opacities of the crystalline lens, see CATARACT. For an account of diseases of the nervous parts of the eye, see AMAUROSIS. Various affections of vision may arise from peculiar or altered conditions of the refracting humors of the eye—as near-sightedness (myopia), far-sightedness (presbyopia), the appearance of bodies (muscæ) floating in or before the eye; and there may be double vision (diplopia), with two eyes or with one: see VISION. The parts between the eye and its bony orbit may be the seat of inflammation, abscess, or tumor, making the eye protrude. The movements of the eyeballs may be affected from palsy of the motor nerves, or from contraction of the lateral recti muscles, causing inward or outward squinting: see SQUINTING. The eye may lose all feeling, from palsy of the fifth pair of nerves. The whole of the same side of the face, nostril, and mouth, will be in the same condition, and the eye becomes inflamed and disorganized. Substances thrown against the eye may injure it. Quicklime is rapidly destructive to the eye, slacked lime and mortar less so. When one of these, or any other caustic, has made entrance into the eye, sweet oil is the best thing to introduce, until the surgeon arrives to remove them. If it is oil of vitriol (sulphuric acid) that has been the cause of the injury, a weak solution of soda may be used in the first place to neutralize the acid. In gunpowder explosions near the eye, besides the burn, the particles are driven into the surface of it, and will cause permanent black stains over the white of the eye, unless they are carefully removed at the time. When chips of glass, stone, etc., are driven into the interior of the eye, there is little hope of it being saved from destructive inflammation. When only partially sunk into the cornea, as is often the case with sparks of hot iron, or 'fires,' as they are called, the rubbing of the projecting part on the eyelid causes great pain, and the surgeon has not much difficulty in removing them. Most commonly these, or other 'foreign bodies,' as particles of dust, sand, seeds, flies, etc., merely enter the space between the eyeball and the lids, almost always concealed under the upper, as it is the larger, and sweeps the eye. They cause great pain, from the firmness and sensitiveness of the papillary surface of the lid, soon excite inflammation, and their presence, as the cause, is apt to be overlooked. The lid must be turned round to find them. To do this, pull the front or edge of the lid forward by the eyelashes, held with the finger and thumb, and at the same time press down the back part of the lid with a small pencil or key. The lid will readily turn round, when the body may be seen about its middle, and may be removed with the corner of a handkerchief. Another plan is to pull forward the upper lid by the eyelashes, and push the lashes of the lower lid up behind it, when the foreign body may be brushed out.

EYE'BRIGHT (*Euphrasia*): genus of plants of the nat. ord. *Scrophulariaceæ*, having a tubular calyx, the upper lip of the corolla divided, the lower of three nearly equal lobes, the cells of the anthers spurred at the base, a two-celled capsule and striated seeds. (See Euphrasy.) Some of the species are root-parasites. Common E. (*E. officinalis*), is a little plant of at most six or eight inches in height, with ovate serrated leaves, and white or reddish flowers streaked with purple, appearing singly in the axils of the leaves. It is very abundant in many pastures in Europe, and even on high mountains, where—as in far northern regions—it is often seen of only an inch in height, gemming the ground abundantly with its bright little flowers. It is a very widely distributed plant, a native of most parts of the n. of Asia, the Himalaya, etc. It was formerly in great repute as a cure for ophthalmia, and is still much used in rustic practice for diseases of the eye. A spot on the corolla, something like a pupil, gave it much of its reputation, while the fanciful doctrine of *signatures* prevailed in medicine; but it has been found really efficacious in catarrhal inflammations of the eye, and in other catarrhal affections. It is a weak astringent. It is the *Euphrasy* of Milton, with which he represents the archangel Michael as *purging the visual nerve* of Adam.

Common Eyebright.
(*Euphrasia officinalis.*)

EYLAU, *ī'low*, usually called Prussian Eylau: town in the govt. of Königsberg, 22 m. s. of the town of Königsberg; celebrated for the battle between Napoleon and the allies—Russians and Prussians—under Bennigsen, 1807, Feb. 8. The French force amounted to about 80,000, and the allies numbered 58,000, but were superior in artillery. The battle opened soon after daylight with a furious attack by the French left on the Russian right and center, which proved utterly unsuccessful, the attacking corps being almost destroyed. The murderous struggle was repeatedly renewed, and the promise of victory alternated now to the one side and now to the other. Night closed upon the whole allied line pressing onward and driving the French before them. Nevertheless, the victory is generally claimed by the latter, chiefly because the allied forces, unable to recruit their strength, were ordered to retreat from the field on the night of the battle, and to retire upon Königsberg. The loss of the allies is estimated at about 20,000, while that of the French must have been considerably greater.—Pop. of town abt. 3,600.

EYOT, n. *ī'ŏt* or *āt* [AS. *ey*, or *ig;* Icel. *ey*,an island: a little island in a river or lake: usually written *ait.*

EYRANT, or Ayrant, a. *ā'rant:* in *her.*, term applied to eagles and other birds in their nests.

EYRE, n. *ār* [OF. *eirre*, a journey—from L. *iter*, a journey—gen. *itĭnĕrĭs*, of a journey]: in *law*, a journey in circuit of certain judges: see Eire, Justices in.

EYRE, *är*, Edward John: explorer and colonial governor: b. 1817; son of an English clergyman in Yorkshire. Emigrating to Australia at the age of 17, he was prosperous, and soon became a magistrate. In 1840, he failed in an attempt to explore the region between S. and W. Australia—a task which he accomplished in 1841 in spite of enormous difficulties. In 1846, he became lieut.gov. of New Zealand, and in 1852 of St. Vincent. In 1862 he was appointed gov. of Jamaica, where in 1865 negro disturbances broke out. E., resolving upon prompt measures, proclaimed martial law; a Mr. Gordon, believed to have had a leading part in the rising, was hurriedly tried by court-martial, and hanged two days after, the sentence having been confirmed by E. A commission sent to inquire into this case, found that Gordon had been condemned on insufficient evidence, and E. was recalled. On his return he was prosecuted for murder by a committee, of whom J. Stuart Mill was the most prominent; Mr. Carlyle and Sir R. Murchison promoted the E. defense fund. The charge of murder was dismissed by the magistrates of Market-Drayton 1867. Since then E. has lived in retirement.

EYRIE, or Eyry, n. *ē'rĭ* or *ā'rĭ* [OF. *aire*, an eyry or nest of hawks (see Aerie)]: the nest of a bird, especially of a bird of prey; spelled also *aerie.* Eyas, n. *ī'ăs* [F. *nīais*, simple: originally meant, 'caught in the nest'—from *nīdus*, a nest]: a young hawk just taken from the nest, and not able to prey for itself

EZEKIEL, *ĕ-zē'kĭ-ĕl* (meaning 'God will strengthen,' or 'strength of God'): one of the Hebrew prophets, son of the priest Buzi. With Jehoiachin, King of Judah, he was carried captive, when still a young man, to Mesopotamia, by order of Nebuchadnezzar, about B.C. 598. He was a member of the Jewish community which settled on the banks of the river Chebar, and first appeared as a prophet about B.C. 594. His prophetic career extended over a period of 22 years. The date of his death is not recorded.

The Book of Ezekiel consists of three great parts: the *first* (chapters i.–xxiv.), composed before the final conquest of Jerusalem by Nebuchadnezzar, announces the complete overthrow of the kingdom of Judah, on account of its increasing unfaithfulness to God; the *second* (chapters xxv.–xxxii.) threatens the surrounding nations, which were exulting maliciously over the ruin of Judah, with divine punishment; and the *third* (chapters xxxiii.–xlviii) prophesies the future deliverance of the Hebrew nation, and the rebuilding of Jerusalem. This last portion is generally believed to contain several Messianic predictions, three of which are considered specially remarkable (chaps. xxxvi., xxxvii.; xxxviii., xxxix.; and xl.–xlviii.); and it is beyond all question that only under a world-wide dispensation like the Christian can the glorious visions of the prophet receive a historical realization. The book is full of magnificent but artificial symbolism, and of allegories difficult to understand; whence Jerome calls it 'a labyrinth of the mysteries of God;' but here and there, as in chapters i. and ii., it contains visions that indicate a most vivid and sublime imagination. E.'s authorship of the book has been questioned. The Talmud says, it was written by the Great Synagogue, of which E. was not a member; and Ewald, believing that traces of later elaboration are obvious, suggests that the collection and combination of the various prophesies into a book may not have been the prophet's own doing. The opinion of most critics, however, is, that a prophet who was so much of a literary artist as E., was more likely to have completed the book himself than to have left such a work to others. The text is far from being in perfect condition. It is partly corrupted by glosses, has partly been retouched by later hands, and may often be amended by the Septuagint version. See commentaries and works on Ezekiel by Hävernick, Hitzig, Ewald (in *The Prophets of the Old Testament*), Fairbairn, Hengstenberg, Keil.

EZRA, *ĕz'rȧ:* Jewish lawgiver, B.C., 5th c.; descended from a distinguished priestly family, and resident in Babylon in the reign of Artaxerxes Longimanus. With this monarch he seems to have been in considerable favor, and obtained permission B.C. 478 to return to Jerusalem with a band of his countrymen amounting to 1754. His services to the new colony in regard to their civil and religious condition were very important. He endeavored to re impose more strictly the law of Moses, forbidding marriages with heathen women, and disannulling such ties where they had been formed. He also introduced into Jewish literature the square Chaldee character, instead of the old Hebrew or Samaritan one, which had been customary till then; but the tradition that he re-wrote from memory the sacred books burned at the destruction of the temple, deserves no regard; and it is likewise a mere tradition that as president of the so-called Great Synagogue (an assemblage of Jewish scholars) he arranged and completed the canon of the Old Testament. See BIBLE.—The book called by his name, with the book of Nehemiah, formed, among the Jews, the first and second books of Ezra. It records events which extended over nearly 80 years, and divides itself naturally into two parts. The first six chapters embrace a period of 21 years, and relate the history of the first return from the Babylonian captivity; the rest of the book chronicles the *second* return under Ezra the priest, in the reign of Artaxerxes Longimanus. The book is written partly in Chaldee; and is by some critics supposed to be the work of various authors. But the Jews have always maintained its canonical authority, and have even compared Ezra with Moses. Those who ascribe to him the authorship of the whole book, consider that he drew from various sources the materials for the first part. The second part relates events in which he was himself the leader.

F.

F, f, *ĕf:* sixth letter in the Latin and English alphabets, corresponding to the *Vau* of the Hebrew, and the *Digamma* (q.v.) of the old Greek alphabet: see ALPHABET. *F* and *v* are called *labio-dentals,* from the organs employed in sounding them; they belong to the class of consonants called aspirates (q.v.), and bear the same relation to each other that exists between the unaspirated labials *p* and *b.* In Latin, *f* had a peculiar sound, different from that of Greek *φ,* as we learn from Cicero and other Latin writers. What the sound was, we do not exactly know, but it approached a strongly breathed *h,* as is indicated by the fact, that in the Sabine dialect it sometimes takes the place of *h,* as Sab. *fircus* = Lat. *hircus* (a he-goat); and the Latins made use both of *faba* and *haba* for 'a bean.' This affinity is also shown in modern Spanish, where *h* takes the place of the Latin *f;* as Lat. *femina,* Sp. *hembra; fl* becomes, in Spanish, *ll,* as Lat. *flamma* = Sp. *llama.* F, in English and other Teutonic tongues, corresponds to *p* in Greek and Latin; as Lat. and Gr. *pater* = Eng. *father;* Gr. *pod-,* Lat. *ped-* = Eng. *foot;* Lat. *pisc-* = Eng. *fish;* Gr. *pur* = Eng. *fire;* Lat. *vulp-* = Eng. *wolf.* In some words, *v* takes the place in German of *f* in English; as Ger. *vater* = Eng. *father;* Ger. *vier* = Eng. *four.* In the Aberdeenshire dialect, *f* takes the place of *wh,* as *fat* for *what; fup* for *whip.* This seems to be a relic of the Teutonic pronunciation of *w* (=*v*), still observed in the Cockney pronunciation of *vill* for *will, ven* for *when;* but why the sharpening of the labial into *f* should be confined to one circumscribed district of Scotland, and to the case of *w* followed by *h,* is not evident.

F in Lat. and Greek becomes *b* in Eng.; as Gr. and Lat. *fer-* = Eng. *bear;* Lat.; *frater* = Eng. *brother.* See Letter B.

More remarkable are the interchanges between *f* and the series *d, th, t.* Lat. *foris* = Gr. *thura,* Eng. *door;* Lat. *fera* = Gr. *ther,* Eng. *deer;* Eng. *red,* Skr. *ruthira,* Gr. *eruthros,* Lat. *rutilus, rufus, ruber.* In Russian, *Feodor, Afanasja* = *Theodor, Athanasia.* In words originally common to both Greek and Latin, the Greek *φ* is represented in Lat. by *f;* as Gr. *φημη* = Lat. *fama.* But in spelling Greek words with Latin letters, the Romans, after the time of Cicero, were careful to represent *φ,* not by *f,* which had a somewhat different power, but by *ph.* This mode of spelling words derived from Greek is still adhered to in English, German, and French, though the distinction in sound has long been lost sight of. The distinction began to disappear in the Latin itself in the time of the later Roman emperors, when inscriptions show such spelling as *Afrodite* for *Aphro-*

dite; and this simplification is followed in modern Italian, Spanish, and Portuguese. *Ph* is sometimes erroneously used in words having no connection with Greek; as Adolphus, for the Teutonic Adolf or Adalolf—i. e., 'noble wolf.

F, as a numeric symbol, is used for 40, and with a dash over it for 40,000.

F, in Music: fourth note of the natural diatonic scale of C; stands in proportion to C as 4 to 3, and is a perfect fourth above C as fundamental note. F major, as a key, has one flat as its signature—viz., B. flat. F minor has four flats the same as A flat major, of which it is the relative minor.

FA, *fâ:* in *music,* the fourth sound in the scale of the sol-fa notation = F.

FAAM, *fâ'am,* or FAHAM, *fâ'ham* (*Angræcum fragrans*): an orchid, native of India and the Mascarene Isles, much prized in the East for the delightful fragrance of its leaves, due to the presence of *Coumarine* (q. v.), and resembling that of the Tonka Bean and of Vernal Grass. In the Isle of Bourbon, an infusion of F. leaves is in great repute as a cure for pulmonary consumption and as a stomachic. In France, it has been successfully used under the name of *Isle of Bourbon Tea,* as an expectorant, anti-spasmodic, and stomachic.

FABACEOUS, a. *fă-bā'shŭs* [L. *faba,* a bean]: bean-like; pertaining to a bean. FABACEÆ: see LEGUMINOSÆ.

FABER, n. *fā'bĕr* [L.]: a fish, the dory.

FABER, *fâ'bĕr,* CECILIA BÖHL VON: 1797–1877, Apr. 7; b. Morges, Canton de Vand, Switzerland: Spanish novelist. She received the greater part of her education in Germany, learned German, Spanish, Latin, English, French, and Italian languages; and married first, 1814, Capt. Planells, with whom she lived in the United States some years; then, on his death, the Marques de Arco Hermosa, who introduced her to the court at Madrid; and, again becoming widow 1835, Senor de Arrom, a lawyer with whom she had little happiness. It was not till after her 50th year that she became an author, and assumed the masculine pseudonym *Fernan Caballero.* Her first novel was *La Gaviota,* and appeared in instalments in a Madrid newspaper 1849. It was followed by *Elia, Clemencia, La Familia de Alvareda, Una en Otra, Simon Verde,* and numerous *Cuadros de Costumbres populares,* all of which in translated form achieved a European reputation. In 1859 she was appointed governess to the royal children, and an edition of her works in 13 vols. was issued from the royal printing press.

FABER, *fā'ber,* FREDERICK WILLIAM, D.D.: 1814, June 28—1863, Sep. 26; b. Calverly, Yorkshire, England: hymnologist and theologian. He graduated at Oxford 1836; became rector of Elton 1843; adopted the Rom. Cath. faith 1845; founded a religious community at Birmingham, called Wilfridians, which was merged into the oratory of St. Philip Neri and established in London 1849 and at Brompton 1854; and presided over the oratory till death. He had a deeply fervent devotional spirit and was an eloquent preacher, a lovable man, and author of the hymns: *The Greatness of God, The Will of God, The Eternal Father, The God of My Childhood, Jesus is God, The Pilgrims of the Night, The Land Beyond the Sea, Sweet Saviour, bless us ere we go, I was Wandering and Weary,* and *The Shadow of the Rock.* He also edited the *Oratorian Lives of the Saints,* and published numerous essays, tracts, and doctrinal works.

FABER, George Stanley: Anglican clergyman and author: 1773, Oct. 25—1854, Jan. 27; eldest son of the Rev. Thomas F. He entered Univ. College, Oxford, 1789, where he achieved a brilliant academical reputation. Before his 21st year, he was elected fellow and tutor of Lincoln College. In 1796, he took his degree of M.A.; was Bampton lecturer 1801, in which capacity he delivered the lectures subsequently published under the title of *Horæ Mosaicæ;* and 1805 became vicar of Stockton-on-Tees, Durham. After several changes, he received 1832, the mastership of Sherburn Hospital, near the city of Durham, where he died. F. wrote more than 40 works, several of which, especially those on prophecy, have had extensive popularity. All his writings show classical erudition, and 'a hearty love of hypothesis.' The principal are—*The Genius and Object of the Patriarchal, the Levitical, and the Christian Dispensations* (1823, 2 vols); *The Difficulties of Infidelity* (1824); *The Sacred Calendar of Prophecy* (1828, 3 vols.); *The Primitive Doctrine of Election* (1836), reckoned by some critics his best work; *The Primitive Doctrine of Justification* (1837); and *Eight Dissertations upon the Prophetical Promises of a Mighty Deliverer* (1845, 2 vols.).

FABER, *fâ-bā'* (or LEFÈVRE), Jacobus: 1450–1536; b. Etaples, Picardy, France: pioneer of Protestantism in France. He was of humble parentage, but graduated at the Univ. of Paris. He taught some time, pursued classical studies in Italy, and became prof. of the college of Card. Lemoine in Paris. In 1507, he went to the Benedictine abbey of St. Germain des Près, near Paris, to reside, and there applied himself to Biblical study. Previously he had published with commentaries the *Physics, Methaphysics,* and *Ethics* of Aristotle; now he began more important labors. In 1509 he brought out *Quintuplex Psaltèrium; Gallicum, Romanum, Hebraicum, Vetus, Conciliatum;* 1512, *S. Pauli Epistolæ* xiv. *ex vulgate Editione, adjecta intelligentia ex Græco cum commentariis;* 1517, *De Maria Magdalena et triduo Christi disceptatio,* which was condemned by the Sorbonne; and 1523 his French translation of the New Test. and *Les Épistres et Évangiles pour les LII. dimanches de l'an à l'usage du diocèse de Meaux.* He was condemned and had his works suppressed by parliament 1525, but the proceedings were subsequently quashed; became librarian in the royal palace at Blois 1526; published a translation of the Pentateuch 1528; and completed his translation of the Bible 1530.

FA'BER, John: d. prob. 1756; son of John F. (mezzotint engraver, b. Holland, came to England, d. Bristol, 1721, May): like his father an engraver in mezzo-tinto. His principal works are the portraits of the Kit-Cat Club, and the Beauties of Hampton Court, several of which are executed with great freedom, vigor, and beauty. F. lived in London, where he is believed to have died.

FABIAN, a. *fā'bĭ-ăn:* applied to tactics, or to a policy of careful waiting and watching without any positive conflict, in order to weary out an opponent, or take advantage of his errors—so named from Quintus *Fabius* Maximus (see FABIUS). FABIAN GENS: see FABIUS.

FABIUS, *fā'bĭ-ŭs:* name of one of the oldest and most illustrious patrician families of Rome. Three brothers of this name alternately held the office of consul for seven years (B.C. 485–479). In 479, the Fabii, under K. Fabius Vibulanus, migrated to the banks of the Cremera, a small stream that flows into the Tiber a few miles above Rome. Here, two years afterward, they were decoyed into an ambuscade by the Veientes, with whom they had been at war, and with the exception of one member, who had remained at Rome, and through whom the race was perpetuated, the entire *gens*, 306 men, were put to the sword.—The most eminent of the Fabii were Quintus Fabius Rullianus—supposed the first who obtained for himself and his family the surname of *Maximus*—and his descendant, Quintus Fabius Maximus Verrucosus, named Cunctator, the Delayer. The former was the most eminent of the Roman generals in the second Samnite war, was twice dictator, and six times consul.

FABIUS CUNCTATOR (d. B.C. 203), who, in the course of his career, was five times consul, and twice censor, was elected dictator immediately after the defeat of the Romans at Trasimenus. The peculiar line of tactics which he observed in the second Punic war obtained for him the surname by which he is best known in history. Hanging on the heights like a thundercloud, to which Hannibal himself compared him, and avoiding a direct engagement, he tantalized the enemy with his caution, harassed them by marches and counter-marches, and cut off their stragglers and foragers, while his delay allowed Rome to assemble her forces in greater strength. This policy—which has become proverbial as 'Fabian policy'—although the wisest in the circumstances, was not appreciated either in the camp or at home; and shortly afterward Marcus Minucius Rufus, Master of the Horse, was raised to an equal share in the dictatorship, a position, however, which he held only a short time. During his fifth consulship, Fabius recovered Tarentum, which had long been one of Hannibal's important positions.

C. FABIUS, surnamed Pictor, executed upon the walls of the temple of Salus—dedicated by the dictator C. Junius Brutus Bubulus in 302—the earliest Roman paintings of which we have any record; and his grandson Q. Fabius Pictor, was the first writer of a Roman history in prose.

FABLE, n. *fā'bl* [F. *fable*—from L. *fabŭlă*, a story]: a short tale or story intended to instruct or amuse, the incidents of which are improbable: an idle story; a falsehood: V. to write fiction; to tell falsehoods; to feign. FA'BLING, imp. *-blĭng:* ADJ. dealing in fables. **FABLED**, pp. *fā′bld:* ADJ. feigned; celebrated in fables. **FA′BLER**, n. one who. **FABULIST**, n. *făb′ū-lĭst,* a writer of fables. **FAB′ULOUS**, a. *-lŭs,* full of fables, pretended or feigned; fictitious. **FAB′ULOUSLY**, ad. *-lĭ.* **FAB′ULOUSNESS**, n. **FAB′ULIZE**, v. *-līz,* to compose fables; to write or speak in fable. **FAB′ULI′ZING**, imp. **FAB′ULIZED**, pp. *-līzd.*—*Fable* is a word of twofold signification. First, it is employed by some writers in a general sense to denote any fictitious narrative, as for example, the incidents in an epic or dramatic poem. At one time also, when the myths of the Greeks and Romans were thought to be satisfactorily accounted for by regarding them as conscious inventions of the ancient poets and priests, it was customary to speak of them as *fables,* but this application of the term is now abandoned by scholars: see MYTH. According to the second and more frequent signification of the word, Fable denotes a special kind of literary composition, either prose or verse, in which a story of some kind is made the vehicle for conveying a universal truth. It differs from a parable in this respect, that while the latter never transcends in conception the bounds of the probable or the possible, the former always and of necessity does. The story of the 'Good Samaritan' imagined by the Savior, is a parable; if it was not history, it might have been, for it contains nothing either improbable or impossible; but when Jotham went up to the top of Mount Gerizim and spoke to the men of Shechem about the trees going forth to anoint a king over them, he made use of a fable proper. The peculiarity, therefore, of the *structure* of the fable consists in the transference to inanimate objects, or, more frequently, to the lower animals, of the qualities of rational beings. By the very novelty and utter impossibility of the representation, the interest of the hearer or reader is excited, and thus its symbolic meaning and moral become transparent to him, at least if the fable is well contrived. The ancient fabulists were simple, clear, and earnest in their representations. They seem to have sprung up in the East. Among the more celebrated are Bidpai (q.v.), or Pilpai; and the Arabian Lokman, said to have lived in the time of King David. Among the Greeks, the greatest fabulist is Æsop (q.v.), whose fables, at a much later period—the precise time is not exactly known—were versified by a certain Babrius (q.v.). Among the Romans, Phædrus cleverly imitated Æsop, but with considerable modifications, thus giving some independent value to his work. The well-known fable of the *Town Mouse and Country Mouse,* told by Horace, is of purely Roman origin, and is probably the only one in existence of which that can be affirmed. Leaving the classical period, and before entering on the dark ages, we encounter the name of Aphthonius, in the early part of the 4th c., who wrote inferior fables in Greek prose; and still later, the name of Flavius Avianus, who composed 42, no better, in Latin elegiacs. During the dark ages, the fable in various forms appears to have been cultivated in the monasteries, though nothing meritorious has survived; but in the midle ages, it acquired fresh life and vigor. An edition of the fables current in Germany in the time of the Minnesingers has been published by Bodmer. The oldest known German fabulist is Stricker, about the middle of the 13th c.; but the famous mediæval fable of *Reineke Fuchs*, or the History of Reynard the Fox (q.v.), stretches in some of its numerous primitive forms much further back. In later times, most nations have cultivated the fable with more or less success; among the English, Gay; among the Germans, Hagedorn and Gellert, and Lessing; among the Italians, Pignotti; among the Russians, Krylov; and above all, among the French, La Fontaine, whose fables are remarkable for their arch and lively humor, their delicate sarcasm, their sagacity, and felicity of expression. Now, however, the fable has gone out of fashion.—Syn. of 'fable, n.': parable; allegory; fiction; fabrication; novel; romance; story; tale; apologue; untruth; invention.

FABLIAU, plur. Fabliaux, *făb-lē-ō* [from Latin *fabulari, fabellare,* to speak or to tell]: name given in the old French literature to a class of short metrical narratives, intended merely for recitation, which had for their subject-matter the talk and news of the day in the middle ages. The narrator of such news was called a *fableor* (plur. *fablière*), in opposition to the *chanteor,* or singer proper, who composed poems not only for recitation, but also for singing. Besides the fabliaux, the department of the fableor embraced the *Romans d'aventure* (in short unstrophied couplets), usually called *contes,* whence their author or reciter also bore the name of *conteur;* and the *dits,* or sayings, the special cultivator of which was termed a *diseur.* As the fabliaux were fundamentally distinguished from the more genuine forms of poetry by the everyday character of their subject-matter, so the mode of treatment which their authors adopted was also more anecdotical, epigrammatic, and witty—the wit being richly spiced with scandal. They appear to have maintained a sort of ironical and parodistic antagonism to the idealism of the epics of chivalry. In these fabliaux, the essential character of the French people manifested itself, with that opposition of the real to the ideal, of the understanding to the imagination, which, after the time of Francis I., began to characterize French literature generally. Thus they lashed not only the priesthood and the nobility in their actual degeneracy, but from the very character of their satire, they engendered a contempt for the religious-chivalric spirit itself, and for all ecclesiastical and knightly notions and ceremonies. The oldest fabliaux are not of French origin; they are a fruit of the Crusades, and were brought to France from the East, but they received a national coloring, and soon took root in the West. From them sprang the drama of France. One of the most fecund fablière was Rutebeuf, who lived in the reigns of Louis IX. and Philippe III., whose works were published by Jubinal (2 vols., Paris 1837). He was a true Parisian, and the prototype of Villon, La Fontaine, and Voltaire. The best collections of fabliaux and contes are those of Barbazan (5 vols., Paris 1756), of Méon (2 vols., Paris 1823), and of Jubinal (2 vols , Paris 1839–43).

FABRETTI, *fâ-brĕt'tē,* Raffaele: antiquary and archæologist: 1618–1700; b. Urbino. He was attracted at an early period to antiquarian studies by the great classical remains of Rome. Under Pope Alexander VII., he became papal treasurer, and subsequently was chancellor to the papal embassy at Madrid. A residence of 13 years in Spain enabled him to explore all the antiquities of the kingdom, and to carry his studies to a point which rendered indispensable his return to Rome, the great parent fount of ancient learning. He was there made judge; and under Innocent XII., became keeper of the papal archives of the castle of St. Angelo, a post which afforded the widest scope to his favorite pursuits. About this time, he wrote his two important works: *De Aquis et Aquaductibus Veteris Romæ* (4 vols. 1680, reprinted with notes and additions 1788), and *Syntagma de Columnâ Trajani* (Rome 1683). His treatise entitled *Inscriptionum Antiquarum Explicatio* (1699) throws invaluable light on the discoveries made by himself in the catacombs; and his erudite investigations concerning the reliefs known as the Iliac Tables, and the grand subterranean canals of Emperor Claudius, are equally full of interest to science. His rare collection of inscriptions, etc., is in the ducal palace of Urbino.

FABRIANO, *fâ-brē-â'nō:* city of Italy, province of Ancona (formerly part of the Papal States), at the base of the Apennine range, 28 m. w. of Macerata. It has a cathedral, and several convents, but is notable chiefly for its great paper manufactures, established 1564. The churches and private houses contain many specimens of the school of painting which flourished here.—Pop. 7,500.

FABRIA'NO, Gentile da: Italian painter, in the early part of the 15th c.; b. at Fabriano; d. some time after 1450. He received his first instructions from his father, who appears to have been a man of superior culture, as he taught his son the elements of physics and mathematics. F.'s first teacher in art was, it is supposed, Allegrette de Nuzio. Subsequently, he went to Florence, and studied under Fiesole. Among his earliest works of note is a fresco of the Madonna in the cathedral of Orvieto. In 1423, he painted an ' Adoration of the Kings ' for the church of the Holy Trinity in Florence. This picture is one of the most admirable belonging to the school of Giotto. To the same period belongs a Madonna with Saints (now in the Berlin Museum). F. afterward went to Venice, where he greatly increased his reputation by a picture of the bloody engagement between the fleet of the Republic and that of the Emperor Barbarossa off the heights of Pirano. The Venetian senate was so delighted with the piece, that it conferred on the fortunate artist the dignity of a patrician, and a pension of a ducat *per diem* for life. Unhappily, this work has perished. Pope Martin V. then called F. to Rome, and employed him, with Vittore Pisanello, in adorning the church of St. Giovanni Laterano. As his share of the work, he painted various incidents in the life of John the Baptist, five prophets, and portraits of Pope Martin himself and ten cardinals. He died, while engaged on this building. F.'s pictures indicate a cheerful and joyous nature. He had a childlike love of splendor and rich ornamentation, but is never extravagant or excessive in his coloring.

FABRIC, n. *făb'rĭk* [F. *fabrique*—from L. *fabrĭca*, the art or trade of an artisan, a workshop: comp. *făcĭō*, I make]: a building; the structure of anything; texture. FABRICATE, v. *făb'rĭ-kāt* [L. *fabrĭcātus*, constructed]: to invent; to devise falsely; to frame; to construct. FAB'RICATING, imp. FAB'RICATED, pp. FAB'RICATOR, n. *-tėr*, one who. FAB'RICA'TION, n. *-kā'shŭn* [F.—L.]: the act of framing or constructing; that which is framed or invented; a falsehood; forgery. —SYN. of 'fabric': structure; construction; edifice; workmanship; framework;—of 'fabrication': see under FABLE.

FABRICIUS, *fā-brĭsh'ŭs*, or FABRIZIO, *fâ-brēt'sē-ō* GIROLAMO, commonly named from his birthplace FABRICIUS AB ACQUAPENDENTE: anatomist and surgeon; 1537–1619. He was the son of humble parents, who, notwiththeir poverty, sent him to the Univ. of Padua, where, in addition to the usual instruction in the classics, he studied anatomy and surgery under the celebrated Fallopius with such success, that on the death of the latter 1562, F. was appointed to the vacant professorship, which he held for nearly half a century, attracting students from all parts of the civilized world. Among these students was Harvey (q.v.) in 1598, who derived from F.'s observations on the valves of the veins the first clue to his great discovery. He was a most laborious investigator of anatomy, and on a more methodical plan than had been attempted by his predecessors. He treated of the eye, the larynx, the ear, the intestinal canal, the development of the fetus, and many other subjects. He introduced great improvements in the practice of surgery; and his *Opera Chirurgica* passed through 17 editions. He wrote numerous other surgical works: all were collected and published by Albinus 1723, more than a century after his death. The Venetian republic erected for him a spacious anatomical amphitheatre, in which his name was inscribed, and at the same time conferred upon him an annual stipend of a thousand crowns, and created him a knight of the order of St. Mark. A few years before his death, he retired from professional duties, and died (some believe he was poisoned by his relatives) in his villa on the banks of the Brenta, which still bears the name of the Montagnuola d'Acquapendente.

FABRICIUS, *fâ-brĭt'sē-ŭs*, JOHANN CHRISTIAN: 1745, Jan. 7—1807; b. Tondern: Danish entomologist. He studied at Copenhagen, Edinburgh, Leyden, and Freyburg, and finally at Upsala, under Linnæus, whose ideas F. was zealously employed throughout his life in developing and applying. In 1775, F. was appointed to the chair of natural history at the Univ. of Kiel, and from that time applied himself to the fuller development of a system of classification of insects, based upon the structure of the mouth. Although his system has been found inapplicable to many families of insects, it has been instructive. The *Systema Entomologiæ* (Copenh. 1775), in which F. expounded his views, constituted a new era in entomology, and his *Genera Insectorum* (Kiel 1776), *Mantissa Insectorum* (Copenh. 1787), and *Entomologia Systematica* (Copenh. 1792), opened new fields to the entomologist. F. was the author of several able treatises on the policy, statistics, and economy of Denmark, prepared in his capacity of councilor of state and prof. of rural and political economy at Kiel. F.'s death at Kiel, was said to have been hastened by his grief at the political misfortunes of his country.

FABRILE, a. *făb'rĭl* [L. *fabrilis*—from *faber*, a workman; Sp. *fabril;* It. *fabbrile*]: pertaining or relating to workmen or to handicraft, as in wood, stone, metal, etc.

FABRONI, *fâ-brō'nē*, ANGELO: 1732, Feb. 7—1803, Sep. 22; b. Marradi, Tuscany: biographical writer. He was educated at Faenza and Rome, and 1773, was appointed tutor to the sons of Leopold, Grand Duke of Tuscany. His *Vitæ Italorum Doctrina Excellentium qui Sæculo XVII. et XVIII. floruerunt* (20 vols. Pisa 1778–1805), is one of the best Italian works of its kind, and is a treasure of information; while his *Laurentii Medicei Vita* (2 vols. Pisa 1784), *Vita Magni Cosmi Medicei* (2 vols. Pisa 1788–9), are reckoned model biographies.

FAÇADE, n. *fă-sâd'* [F. *façade*, the front—from It. *facciata*, the front of a building—from *faccia*, the face—from L. *faciĕm*, the face]: exterior front or face of a building. This term, frequently restricted to classic architecture, may be applied to the front elevation of a building in any style, though generally referring to buildings of some magnitude and pretentions; thus, we speak of the *front* of a house, and the façade of a palace. The back elevation of an important building is called the rear façade, in the same inapt way as in England the back of a house is called the '*back-front.*' An edifice may have any number of façades when it shows a face or front in each direction. An elevation of the side of a building is called by some *lateral* façade. The sides of a court or cortile also are called façades, and are distinguished as north, south, etc., façades.

FACCIOLATI, *fât-cho-lâ'tē*, JACOPO: 1682–1769; b. Torreglia, not far from Padua: Italian philologist and critic. He was educated in the religious seminary at Padua, where he became successively prof. of theology, prof. of philosophy, and supt.-gen. of the classes, or rector of the institution. F. directed his attention chiefly to the revival of the study of ancient literature, and brought out a new edition of *Lexicon Septem Linguarum*, called, from its original author, the monk Ambrosius of Calepio, the *Calepine Lexicon.* He was assisted in this work by his pupil, Forcellini, to whom mainly is owing the conception of a totally new Latin dictionary; an arduous undertaking, which F. continued till his death and which was completed by Forcellini 1771. F. and Forcellini, assisted by several others, likewise published a new ed. of Nizoli's *Thesaurus Ciceronianus.* F.'s Latin epistles and orations are remarkable for the Ciceronian elegance of their style, and his notices on several philosophical writings of Cicero for their solidity, clearness, and taste.

FACE, n. *fās* [F. *face*—from L. *făcĭĕm*, a face, a visage]: the front or surface of anything; appearance; the countenance; look; visible state of affairs; freedom from bashfulness or confusion; boldness; presence or sight, as before the face: V. to meet in front; to meet and oppose with firmness; to cover with an additional surface; to make a false appearance; to stand opposite to. FACER, n. *-er*, blow in the face; a sudden blow, check, or hindrance FA'CING, imp. fronting or opposite: N. a thin covering placed in front for improvement or strength; a thin covering for ornament. FA'CINGS, n. plu. the movements of soldiers to make a front, to the right, to the left, etc.; the collars, lappets, cuffs, etc., of a regimental uniform, which are of distinctive colors. FACED, pp. *fāst.* FACE'LESS, a. without a face. FA'CINGLY, ad. *-lĭ.* TO SET ONE'S FACE AGAINST, to oppose. TO MAKE FACES, *-fā'sĕs*, to distort the face. FACE TO FACE, in immediate presence. TO FACE THE ENEMY, to meet him in front with determination. TO FACE IT OUT, to maintain confidently and without change of color, generally in a bad sense; to pass through the ordeal of a disagreeable personal interview with courage. FACET, n. *făs'ĕt* [F. *facette*, a little face]: a little face; a small plane surface, as of a crystal or a cut gem. FAC'ETED, a. having numerous small surfaces or faces, as cut gems. FACIAL, a. *fā'shal* [L. *faciēs*, the face]: of or pertaining to the face. FACIAL ANGLE, the angle formed by two lines, one drawn horizontally from the nostrils to the ear, and the other upwards from the nostrils to the most prominent part of the forehead (see ANGLE). FACIALSNEURALGIA: see NEURALGIA.—FACIAL PARALYSIS, paralylis of the facial nerve, involving loss of power over the musces of the face. It may affect either side, or both sides, and is attended with loss or partial loss of the power of articulation. FACIES, n. *fā'shĭ-ēz* [L.]: in *nat. hist.*, any common resemblance or aspect among the rocks, plants, animals, or fossils of any area or epoch.

FACETIOUS, a. *fă-sē'shŭs* [F. *facétieux*, facetious—from L. *făcētĭæ*, witty or clever things—from L. *făcētŭs*, courteous, witty: It. *faceto*]: sprightly with wit and good-humor; gay; full of pleasantry; jocular. FACE'TIOUSLY, ad. *-lĭ.* FACE'TIOUSNESS, n. *-nĕs*, pleasantry; sportive humor. FACE'TIÆ, n. plu. *-shĭ-ē* [L.]: witticisms in speaking or writing.—SYN. of 'facetious': jocose; sportive: merry; pleasant; witty.

FACIAL: see under FACE.

FACILE, a. *făs'ĭl* [F. *facile*—from L. *făcĭlĭs*, easy: It. *facile*]: easily persuaded; flexible; yielding; not difficult. FACILITY, n. *fă-sĭl'ĭ-tĭ* [F *facilité*—L.]: ease or readiness in performing; the means by which performance is rendered easy; dexterity; pliancy; readiness in compliance, in a bad sense. FACILENESS, n. *făs'ĭl-nĕs*, easiness to be persuaded or overcome. Facilitate, v. *fă sĭl′ĭ-tāt*, to make easy or less difficult; to lessen the labor of. Facil′itating, imp. Facil′itated, pp. Facil′ita′tion, n. *-tā′shŭn*. Facil′ities, n. plu. *-tĭz*, the means by which the doing is rendered easier; convenient advantages. Facile princeps, phrase, *făs′ĭ-lē prĭn′sĕps* [L. easily first or best]: able to surpass all competitors without exertion.—Syn. of 'facility': ease; easiness; expertness; readiness; affability; condescension; complaisance; ductility.

FACIL′ITY, in the Legal Terminology of Scotland: condition of mental weakness short of that which will justify *Cognition* (q.v.), but which calls for the protection of the law through a process called Interdiction (q.v.), whose object is to prevent the facile person from granting deeds to his own prejudice. See Fraud: Lesion: Insanity. There is no corresponding term in English law, or in that of the United States; but weakness of mind approaching to idiocy is an important element in proving fraud.

FACINGS, n. *fā′sĭngs:* see under Face.

FACINOROUS, a. *fă-sĭn′ō-rŭs* [L. *facinorōsus*, criminal, vicious—from *facĭnus*, a crime]: in *OE.*, wicked; criminal; vicious.

FAC-SIMILE, n. *făk-sĭm′ĭ-lē* [L. *fac*, make; *factus*, made; *sĭmĭlĭs*, like]: an exact copy or likeness; an accurate imitation of an original.

FACT, n. *făkt* [L. *factum*, a thing done—from *facĕrĕ*, to do: F. *fait*, a fact]: anything which is done; an event; a deed; a reality; truth. In fact, in reality, as opposed to supposition. Matter-of-fact, prosaic or material, as opposed to fanciful or poetical.—Syn. of 'fact': act; performance; incident; occurrence; circumstance; situation.

FACTION, n. *făk′shŭn* [F. *faction*—from L. *factĭōnĕm*, a making, a siding with any one—from *făcĕrĕ*, to make or do]: a party in turbulent or disloyal opposition; a cabal; dissension. Fac′tionist, n. one who acts unscrupulously in opposition. Fac′tious, a. *-shŭs*, turbulent; pertaining to or given to faction. Fac′tiously, ad. *-lĭ*. Fac′tiousness, n. disposition to raise opposition on frivolous grounds.—Syn. of 'faction': combination; party; clique; junto; conspiracy; plot.

FACTITIOUS, a. *făk-tĭsh′ŭs* [L. *factĭtĭŭs*, made by art, artificial—from *făcĕrĕ*, to make: F. *factice:* Sp. *facticio*]: artificial; made by art; not natural. Facti′tiously, ad. *-lĭ*. Facti′tiousness, n.

FACTITIVE, a. *făk′tĭ-tĭv* [L. *factĭtŭs*, made or done frequently—from *factus*, made, done]: applied to a verb in which the action expressed produces some change in the object, as, 'He made the water wine.'

FACTOR, n. *făk′tėr* [L. *factor*, a maker or doer—from *făcĕrĕ*, to make: F. *facteur*]: an agent employed by merchants or proprietors to do business for them, or to sell their goods on commission; in *Scot.*, a land-steward; in *arith.*, a multiplier or multiplicand; one of the parts which multiplied together produce a product. The numbers

6 and 4, multiplied together, *make* 24; hence 6 and 4 are called *factors* of the product 24. Every product can be divided by any of its factors without remainder; a factor, therefore, is often called a *divisor*, or measure: 2, 3, 4, 6, 8, 12, all are factors or divisors of 24. Numbers that have no factor or divisor above unity, such as 2, 3, 5, 7, 11, . . . 23, etc., are called *Prime* Numbers: see Numbers, Theory of. Fac'torage, n -*āj.*, the allowance or commission given to a factor. Fac'torship, n. the business of a factor. Factory, n. *făk'tėr-ĭ*, a place where goods are manufactured; the place where factors reside or keep their goods—applied to commercial stations abroad. Factorial, a. *făk-tō'rĭ-ăl*, pertaining to a factory; an element in a computation; an agent in a result. Factorize, v. *făk'tėr-īz*, in *law*, to warn not to pay or give up goods; to attach the effects of a debtor in the hands of a third person.

FACTOR, in Commerce: in general one engaged to do business for another. Factors and brokers are commercial agents employed to buy and sell for third parties, and usually paid by commissions on their transactions. To a F. the goods themselves, termed a 'consignment,' are intrusted for the purposes of a sale, while a broker, without taking possession or exercising control over the goods, negotiates sales or purchases of them. The term 'factor' is used comparatively seldom in the United States, that of 'commission merchant' being generally employed. The same person sometimes acts in the capacity of F. and broker, but in addition to the differences above noted, there are others. There is nothing to prevent the F. from buying and selling in his own name, but the broker is bound, unless otherwise authorized, to buy and sell in the name of his principal. The F. has a lien upon the goods for his advances and commission, but the broker has no lien. Neither F. nor broker has, in the absence of trade usage permitting it, the right to delegate his authority to anybody else unless authorized by the principal. When the F., for an increased compensation, guarantees the payment of sales made by him, he is said to receive a *del credere* (borrowed from the Italian, and equivalent to guaranty or warranty) commission (see Del Credere Commission). When the F. resides in the same state or country as his principal, he is spoken of as a home or domestic F.; residing in a different state or country he is known as a foreign F. A F. is generally authorized to sell on credit, but must be very vigilant that no loss occurs to the principal by reason of bad debts which care and attention might have prevented. As between himself and third parties, the F. is treated as the owner of the goods consigned to him. He has the right to insure such property, though ordinarily he is not bound to do so without agreement express or implied to that effect. A. F. is required to keep the goods entrusted to him with the same care that he would use respecting his own.

Under the English common law, pledges of goods by a

F without authority from the principal were invalid. To modify this rule statutes have been enacted in England, viz. 6 Geo. IV. chapter 94 (1825) known as the Factor's Act, and 5 and 6 Victoria, chapter 39 (1842), and also in the United States, protecting persons, who, relying upon the F.'s apparent ownership and possession of the goods, in good faith advance money to him thereupon.—See AGENT: JUDICIAL FACTOR.

FACTORY: establishment where large numbers of persons co-operate in the production of some article of consumption, the principle of the division of labor being in all cases applied, generally with machinery to a greater or less extent. The F. system is opposed to the practice of individual labor at the homes of the artisans. Every production of art requires a longer or shorter series of operations, often varying considerably in their nature. The hand-worker performs most of these himself; usually the same person begins and completes the article. In a F., every article goes through as many hands or machines as there are separate processes required; each workman performs only one, and that always the same, process. The chief advantages of this way of proceeding are the following: Loss of time is avoided in passing from one operation to another, a loss which is the greater, the greater the difference in the nature of the operation. The workman, confined to one thing, in itself usually simple, not only learns it sooner, but attains a quickness and skill that one distracted with a variety of operations can never attain; besides, the constant occupation with one kind of work leads the workman to improvements in tools and machines which increase rapidity of execution and precision. As only few of the processes are very difficult, it is possible to turn to some account less skilful workmen, and even children, and to assign to each person that kind of work at which he is most effective. All parts of the work, too, that are quite uniform in the case of each article, can generally be done by machinery. Lastly, in factories, there is more opportunity of turning to advantage all kinds of refuse.

A necessary consequence of these advantages is, that the cost of production is less on the F. system than in the other way; also, the articles themselves, when of a nature adapted to this mode of production, are better, and of a uniformity otherwise unattainable. Wherever a comparatively homogeneous material has to be made into a large number of uniform articles, there the F. system is in its proper place. The best examples are spinning, weaving, cloth-printing, pin and needle making, etc. But even in the manufacture of complex articles of different kinds of material, the F. system may be pursued with advantage whenever the number of the articles required is great, and the separate parts of such a kind that a great number can be made exactly alike. This is the case with watches, weapons, locks, etc. Such a manufacture divides itself into as many separate employments as there are parts in each article, and the putting together and adjusting (the 'assembling') forms another. The degree of complexity is carried still further in such cases as the manufacture of carriages, where operations of the most heterogeneous kind concur. In some cases, factories do not concern themselves with the putting together of the parts, but merely produce them for hand-workers and special professionists, as in watch-making. In making clothes and shoes and the like, where each individual article requires special adaptation, F. work is not so entirely suitable. Nowhere have the F. system and the employment of machinery been carried further than in the United States; for instance, one establishment has produced 200 dozen chairs a week, another 1,000 bedsteads, most of the work being done by machinery; and one boot and shoe factory has used 600 bushels of shoe-pegs. Even the killing of pigs is done on this grand scale, one firm at Chicago killing and packing 373,725 hogs in four months.—Factories cannot succeed in great numbers except where the population is sufficiently dense to afford a choice of workers, and also—if there be sharp competition in the production—to prevent too high a rate of wages. Other conditions of a good locality for F. production are, abundance of water-power or the presence of coal for steam power, nearness to the raw material, and good communications.

While the rise and extension of the F. system, viewed from the point of material economics, must be pronounced a decided improvement, it cannot be denied that, socially and politically considered, it has its dark side. The greater the capital and the training necessary for carrying on an extensive establishment, the less prospect the workman has of raising himself to independence. The chasm that separates the mill owner from his dependants is far greater than that which exists between a master artisan and his journeymen. The hope of gradual advancement afforded in the last case supplies a powerful moral support and means of discipline; the impassable gulf in the other, acts as a stumbling-block and temptation. F.-workers are especially disposed to enter heedlessly into marriage, as they require to make no provision for a workshop, tools, and other outlay formerly necessary for entering life; while they have the prospect of the wife, and soon of the children, as contributors to the support of the family. It may, at all events, be affirmed, that the increase and accumulation in masses of the class called *proletaires*, who have no provision for a week but the labor of that week, is favored by the F. system. Moreover, the employment of wife and children as fellow-laborers endangers the bonds of the family; the father can no longer remain master of the house of which he is no longer the sole support; and how much the family affection is thus weakened, is painfully exhibited in the ill-treatment of the younger children, who are prematurely put to labor. At the same time, these evils are not incapable of remedy; nor must it be forgotten that the evil is not peculiar to F. labor, but is a feature of the whole system of recent industrial economics. The very circumstances that give rise to the evils, afford the means of obviating them, if they were only taken advantage of; for, the larger the establishment, the more good can an owner do for his people, and the less it is possible to conceal abuses.

FACTORY ACTS: laws in the interest of workers in factories. The development of the textile industries toward the end of the 18th c , in England, led to the employment of a great many children, sent by the Poor Law authorities from the southern agricultural counties to the districts of Derbyshire, Nottinghamshire, and Lancashire. These children were ill looked after, and the mills generally overcrowded. In 1802, the Morals and Health Act was passed. The introduction of steam led to the Cotton Mills Act, 1819, which fixed the working age of children at nine years, and the working week for them at 72 hours. The Saturday half-holiday did not come until Sir John Hobhouse's Act of 1825. Richard Oastler, the 'Factory King,' was then spreading through the woolen districts of Yorkshire the agitation for the Ten Hours Bill. The Cotton Industry Act, 1831, may be called the first Factory Act; but it was carried out very imperfectly, the men often being compelled to support a fund, out of which the employers' fines were paid. Tom Sadler's Ten Hours Bill, 1832, was lost through the opposition of the manufacturers; and Lord Ashley's Bill, which restricted the working hours of adults, was met by the appointment of a royal commission (1833–4), whose report took the view of the capitalists, that such a restriction would so diminish production as to put them at the mercy of foreign competition. On its recommendations was based Lord Althorp's Act (3 and 4 Will. IV. c. 103), which first made the distinction between children and young persons, and began the system of working children in relays, so as to permit daily education. A singular division of political parties took place on the factory question at this time; the chartists and the conservative protectionists favoring the demands of the artisan class against the whig capitalists and the Anti-Corn-Law League. The first fruit of Lord Ashley's Children Employment Commission was the Mining Act, 5 and 6 Vict. c. 99, which prohibited work underground to women and boys under ten years of age. The alternate day system (with an extension of the hours for schooling) was further developed in the important Factory Act, 1844. A uniform working day, from 6 A.M. to 6 P.M., with a fixed 1½ hour for meals, was at last established for all protected persons by the act 13 and 14 Vict. c. 54. The children's working day was still regulated by the act of 1844; and as this interfered with education under the 'alternate day' system, the anomaly was removed by the act 16 and 17 Vict. c. 104 Manual work had been diminishing in many trades; and in 1861 several restrictions were placed on lace factories and on bake-houses. The next general movement, however, was entirely due to the great Commission of Inquiry, the appointment of which Lord Shaftesbury moved 1861. Their recommendations were well received by the employers, who were now more alive to the advantages connected with sound sanitary conditions for labor. In 1876 the Royal Commission on Factory and Workshop Acts reported that previous legislation had been to a large extent successful; and that, while some occupations were still undoubtedly unhealthful in spite of the sanitary regulations of these acts, the cases in which young children were employed in labor unfitted for their years, or in which young persons and women suffered physicially from overwork, had become uncommon The commissioners, however, proposed large changes in the law, and in particular they proposed the consolidation of the law, then dispersed through 15 statutes—one passed 1802, requiring all apprentices in cotton and woolen factories to be instructed in the principles of the Christian religion. This consolidation has been accomplished by the Factory and Workshop Act, 1878, 41 Vict. c. 16, which deals with five classes of works: (1) Textile factories, which remain very much under the regulations enacted by the Factory Acts of 1844, 1861, and 1874: (2) Non-textile factories, which include the occupations enumerated in the Factory Acts Extension Act, 1864, and the Workshops Act, 1867, whether using mechanical power or not, and also all occupations, not named in these acts, in which mechanical power is used: (3) Workshops, or all unnamed occupations, in which mechanical power is not used, except those named in the acts of 1864 and 1867: (4) Workshops in which none but women above the age of 18 are employed: (5) Domestic workshops, in which the work is carried on in a private house, room, or place in which the only persons employed are members of the same family dwelling there. In class (1), where power is used, and the large majority of workers are women and children, the highest degree of regulation is reached. In class (2), where the labor is not so hard, or the strain of attendance on the moving power not so heavy, the statutory hours of work are somewhat relaxed, but education and sanitary provisions are still compulsory. In class (3) registers of children and young persons, and certificates of age and fitness, are, except in special circumstances, dispensed with. In class (4), the hours for work and meals may be changed, and the sanitary authority is responsible for the sanitary state of the shop. In class (5), there is still greater elasticity as regards hours for work and meals; the medical officer of health inspects the sanitary condition, but the employment of women is entirely unrestricted. A place used solely as a dwelling, a part of a factory used solely for some purpose different from the process carried on in the factory, and a school, are not considered workshops or factories. Straw-plaiting, pillow lace-making, glove-making, and some other handicrafts of a light character, may be carried on by a family in a private house or room, without fixing on the premises the legal liability of a workshop. Again, if the manual labor is exercised only at irregular intervals, and does not furnish the principal means of living to the family, the house will not become a workshop. The act does not apply to persons engaged merely to repair machinery in a factory.

In considering the main provisions of the Act of 1878, it must be kept in view that a 'factory' means a place in which machinery is moved by the aid of steam, water, or other mechanical power; a 'child' means a person under the age of 14 years; a 'young person' means a person between 14 and 18 years of age; a 'woman' means a woman of 18 years and upward; 'parent' includes the person having the custody or control of any child; 'night' means the period between 9 P.M. and 6 A.M. The general *sanitary provision* applicable to all factories and workshops is, that they shall be clean, free from effluvia, not overcrowded, and ventilated so as to render harmless, so far as practicable, the injurious gases, vapors, dust, etc., generated in the process. Where anything is wrong, the factory inspector gives notice to the sanitary (local) authority. Every factory is to be lime-washed once in 14 months, unless painted in oil once in 7 years, when it must be washed once in 14 months. The inspector may order fans to be used where dust is generated by grinding, glazing, or polishing on a wheel. Special provision is made for the painting of bakehouses, and for the protection of workers in the wet-spinning process. The obligation to fence factory machinery in an efficient manner applies to every hoist or teagle near to which any person is liable to be employed, every fly-wheel connected with mechanical power, every part of a steam-engine and water-wheel, and every wheel-race. The inspector may also require the fencing of any driving strap, or band, or other part of machinery which he considers dangerous, or of any vat, pan, or other structure filled with hot liquid or molten metal so as to be a likely source of danger to the protected classes. Children must not be set to clean any part of the machinery while in motion; as regards young persons and women, the prohibition extends only to mill-gearing. No work is to be done between the fixed and traversing parts of a self-acting machine while moved by mechanical power. The general rules for hours of employment of young persons and women in the textile factories are 6 A.M. to 6 P.M., or 7 A.M. to 7 P.M., except on Saturdays, and on Saturdays 6 A.M. to 12.30 or 1 P.M. (according to the time allowed for meals), or 7 A.M. to 1.30 P.M. Two hours (one of them before 3 P.M.) must be allowed for meals on every day except Saturday, on which half an hour is sufficient. The employment is not to be continuous more than 4½ hours without an interval of half an hour for meals. The variations on these rules for young persons and women in a non-textile factory, and for young persons in a workshop, are that the minimum time for meals is reduced to 1½ hour, and the period of continuous employment is extended to 5 hours. As regards children in textile factories, they must be employed on the system of morning and afternoon sets, or on that of alternate days. Their morning set ends at 1 P.M., or dinner-time, if that is earlier; the afternoon set begins at 1 P.M., or after dinner, if that is later. The Saturday hours for children are the same as for others. Neither set is to be continued more than seven days, and no child may be employed on two successive Saturdays. Under the alternate day system, the hours for employment and meals are the same as for young persons. In workshops in which neither children nor young persons are employed, the hours for women are 6 A.M. to 9 P.M., with 4½ hours for meals and absence for work; and on Saturdays, 6 A.M. to 4 P.M., with 2½ hours for these purposes. As regards *domestic* workshops, the most important specialty is that the alternate system for children may not be used. The actual times for work and meals are not fixed, but overtime is prohibited, and the shops are under the sanitary supervision of the local authority. The two points fixed by statute with reference to meals in factories and workshops generally are: That the three classes of children, young persons, and women must have their meals at the same hour; that during that hour none of them is allowed to remain in a room where the manufacturing process is being carried on. In every factory and workshop the period of employment, prohibitions, meal hours, and system of children's labor, all must be published in a notice put up within the premises. Employment of children under the age of ten, and of any of the protected classes on Sunday, is prohibited. The occupier is also bound to give eight half-holidays in every year besides (in Scotland) the sacramental fasts. In trades carried on in connection with the retail business, the home secretary may authorize the giving of separate holidays to different classes of workers; and in other cases (e.g. in provincial towns where Saturday is the market day) he may substitute another week-day for the Saturday half-holiday. A child, employed on the morning and afternoon set, must give one school attendance on each work day, and, if employed on the alternate day system, two school attendances on each non-working day. The penalty is that the child cannot be employed in the following week before the deficiency in school attendances has been made up. It is the duty of the employer to get every week from the teacher a certificate of attendance. He may also be obliged to pay to the school-manager a sum not exceeding 3*d.* a week, or one-twelfth part of the child's weekly wages. A child of 13 years, however, on obtaining a certificate of proficiency, will be treated as a young person. No child or young person under the age of 16, is to be employed in a factory more than seven days without a certificate of age and physical fitness granted after personal examination by the medical officer or certifying surgeon of the district. When an accident occurs in a factory or workshop which causes loss of life, or prevents the person injured resuming work within 48 hours, notice must be given to the inspector and the medical officer or certifying surgeon, the latter of whom must go at once to the premises and report to the inspector on the nature and cause of the death or injury.

The Act imposes numerous special restrictions. For instance, no children or young persons are allowed to work at silvering mirrors by the mercurial process, making white lead, melting or annealing glass. Children must not be employed in dipping lucifer matches, or dry grinding in the metal trade. Girls must not be employed in making or finishing bricks or salt. In glass and earthenware works and others, certain parts of the works must not be used for taking meals The home secretary has power to extend such restrictions to other unwholesome occupations. Again, where the customs and exigences of a trade require it, the home secretary may alter the hours of labor to 8 A.M. and 8 P.M., or even 9 A.M. and 9 P.M. Of the first class, lithographic printing, envelope making, biscuit making, and bookbinding are examples; of the second, the straw-hat making at Luton, and warehouses in London and elsewhere. The administration of the Act is carried on by inspectors, appointed and paid by government. They have large powers of entering factories, workshops, and schools, of asking for documents, of examining persons on oath. A special warrant is required to enter a dwelling-house. The inspectors report to government annually. The certifying surgeons appointed by the inspectors are entitled to charge for their statutory duties certain fees, which are paid by the employer, but which he may deduct from wages.

Laws in the United States for protection of Factory Operatives.—Legislation on this subject has not in the United States, assumed so comprehensive a character as in England, largely for the reason, that the evils, to remedy which the first British factory acts were passed, never existed to any such extent as in the old country. Statutes have been enacted in the States of Me., N. H., Vt., Mass., R. I., Conn., N. Y., N. J., Penn., Md., Ind., and O., regulating to a certain degree labor in factories, but still leaving very much of the subject unlegislated upon. These laws regulate principally the age at which children shall be permitted to enter factories and the number of hours they may work daily therein. The age varies in the different states, but 10 years is the earliest at which children are allowed to work. Provision is usually made for compulsory school attendance during at least a portion of the year for children between 10 and 15 years of age. The hours of daily labor of children between 10 and 15 are generally not permitted to exceed 10, in some states 8 being fixed as the maximum. For the special benefit of females working in factories and stores, laws have been enacted compelling employers to furnish seats which they must allow such females to use when the latter are not occupied with their regular duties. For the benefit of both adults and children the laws in some states require employers to provide appliances for the prevention of accidents from dangerous machinery, and owners of buildings to erect suitable exits and fire escapes. Charged with the duty of enforcing the laws, inspectors of factories and public buildings have been appointed. Bureaus of labor statistics, performing very useful services in the collection and dissemination of facts bearing upon the factory system as a part of larger labor questions, have been established in Mass., N. Y., Cal., Mich., Wis., Penn., Miss., O., N. J., Ill., Ind., Io., Md., Kan., Conn., N. C., Me., Minn., Colo., and R. I.; also a

National Bureau at Washington under the Federal government. (For a very valuable monograph on the factory system in the United States, treating the subject in all its bearings, see Report of Carroll D. Wright, 10th U. S. Census, Vol. II. 531).

Among authorities on this subject, besides the great parliamentary reports of 1841–2, 1862–66, and 1875 are Von Plener's *Die Englische Fabrikgesetzgebung*, of which Mr. Mundella procured a translation 1873; Engels, *Lage der Arbeitenden Classe in England;* Marx, *Das Capital;* Faucher *Etudes sur l'Angleterre;* Alfred's *History of the Factory Movement;* Fielden's *Curse of the Factory System;* Sadler's *Factory System.*

FACTOTUM, n. *făk-tō'tŭm* [L. *fac*, do; *tōtŭm*, the whole]: one who does all kinds of work; a humble friend or confidential servant who is ready to do any kind of work.

FACULÆ, n. plu. *făk'ū-lē* [L. *facŭlă*, a little torch: It. *facola*]: spots seen sometimes on the sun's disk, which appear brighter than the rest of its surface: see Sun.

FAC'ULTIES, Court of: established in the reign of Henry VIII., in England, by acts giving authority to the Abp. of Canterbury and his successors to grant dispensations, faculties, etc., by himself or his sufficient and substantial commissary or deputy, for any such matters not being repugnant to the Holy Scriptures and the laws of God, whereof before such dispensations, etc., had been accustomed to be had at the see of Rome. Up to the time of passing this act, the pope, notwithstanding the statutes which had been passed restraining his authority, continued to exercise his power, and to draw a considerable revenue for indulgences, etc. The chief officer of the court is called *magister ad facu'tates.* The sittings of the court have always been held at Doctors Commons (q.v.). On its first institution, there were various matters in which the dispensing power was called into exercise—such as the power to hold two or more livings (see Pluralism), and the permission to eat flesh in Lent, etc. But of late years the matter which has chiefly occupied the court has been the granting license to marry without publication of banns: see License: Marriage; Dispensation.

FACULTY, n. *făk'ŭl-tĭ* [F. *faculté*—from L. *facŭltātĕm*, capability, power—from *făcĭlĭs*, easy. It. *facolta*]. the power of doing anything; a power or capacity of the mind; ability; skill derived from practice; the professors in a college, or of a department in a university (see College: University): an ecclesiastical dispensation. The Faculty, the medical profession. Faculty of Advocates, in *Scot.*, the members of the bar, taken collectively (see Advocates). Fac'ulties, n. plu. *tĭz*, powers of the mind, especially of the intellect. Reid considered that the characteristic of a faculty was its *primitive* character, as opposed to the acquired powers, or habits. Sir W. Hamilton remarks on this distinction as follow. Powers are *active* and *passive*, *natural* and *acquired*. Powers natural and active are called *faculties*. Powers natural and passive *capacities* or *receptivities*. Powers acquired are habits, and habit is used both in an active and passive sense.'—Reid, p. 221. Hence, in discussing the intellect, whatever are considered its primary or fundamental functions, are its faculties. Perception, Memory, Reasoning, Imagination, are the leading intellectual faculties according to the older metaphysicians, who followed the popular classification. These would not now be considered as giving the ultimate analysis of the intellect. Conscience, or the moral sense, has sometimes been called the *moral* faculty: see Intellect.—Syn. of 'faculty': power; talent; gift; endowment; dexterity; adroitness; knack; capacity; privilege; authority; license; dispensation.

FAC'ULTY, Grant of, by the Ordinary, in the Church of England: order by the bishop of a diocese to award some privilege not permitted by common law. A F. is necessary in order to effect any important alteration in a church, such as the erection of a gallery or of an organ. Without a F., a person is not entitled to erect a monument within the walls of a church. But a monument having been put up, though without a F., cannot be removed till a F. or order to that effect has been obtained. By the common law of England, every parishioner is entitled to a seat in church, but no one has a claim to any particular seat, unless the right has been given by a faculty: see Pews.

FAD, n. *făd* [colloq., etym. doubtful]: a crotchet; a hobby; a favorite theory or idea.

FADDLE, v. *făd'l* [imitative of rapid movements: Gael. *fadal*, tedious]: to trifle; to toy. Fid'dle-fad'dle, n. idle or purposeless action or talk.

FADE, v. *fād* [Dut. *vadden*, to wither—from Sw. *fladra*, to flutter: F. *fade*, insipid, dull]: to decay or wither; to droop; to lose lustre, color, or freshness; to cause to wither; to lose strength; to vanish. Fa'ding, imp.: Adj. subject to decay; liable to lose freshness and vigor; not durable: N. in *OE.*, a kind of ending to a song. Fa'ded, pp.: Adj. become less vivid in color; withered. Fade'less, a. that cannot fade. Fa'dingly, ad. *-lĭ*. Fa'dingness, n.

FADGE, v. *făj* [AS. *gefégan*, to join: Gael. *faigean*, a sheath: Dut. *voegen;* Ger. *fügen*, to become, to suit with]: in *OE.*, to suit; to fit; to answer the purpose intended. Fadg'ing, imp. Fadged, pp. *făjd*.

FAEBERRY: same as Fayberry.

FÆCES, n. plu. *fē'sēz* [L. *fæcēs*, dregs or sediment]: solid excrement; sediment or settlings. Fæ'cal, a. *-kăl*, relating to excrement.—*Fæces* are matters which an animal ejects from the lower end of the intestinal canal; in greater part, consisting of those portions of food which, on passing through the alimentary canal, have been rejected as comparatively worthless in the office of nutrition. In the higher animals, fæces generally contain about three-fourths of their weight of water, the remaining one-fourth consisting, in greater part, of organic remains; in the case of the ox, sheep, and other herbivorous animals, of undigested woody fibre. In the human subject, the quantity of fæces yielded daily by an average healthy man is 5 to 6 ounces, the peculiar brown color is due to the presence of decomposing biliary matter, and the odor to partially changed nitrogenous substances resembling caseine. The following table gives the composition of human and ox fæces:

Human.		Ox.	
Water,	73·3	Water,	70·00
Organic remains,	7·0	Woody fibre,	22·50
Biliary and nitrogenous matter,	14·9	Wax,	0·76
Albumen,	0·9	Sugar,	3·00
Extract,	2·7	Albumen,	2·00
Salts,	1·2	Resin and Salts.	1·74

For use as manure, these fæces are of little value as compared with guano, dissolved bones, or superphosphates, and, indeed, the principal effete matters of importance to the agriculturist are resident in the urine or liquid excrement of the higher animals. In the case, however, of birds and reptiles, the urine and fæces are voided together more or less moist, and hence the richness of such excrementitious matter, and its high agricultural value: see GUANO. The following table gives the composition of the fæces of the boa constrictor.

Uric acid	90·16
Ammonia	1·70
Potash	3·45
Sulphate of potash	0·95
Phosphate of lime, etc.	0·90
Mucus and coloring matter	2·94
	100·00

FÆCULA, n. *fĕk'ū-lă*, FÆCULENT, FÆCULENCE: see under FECULA.

FAED, *fād*, JOHN: Scottish painter: b. 1820, at Burley Mill, in the stewartry of Kirkcudbright, where his father was an engineer and millwright. When but just entered on his teens, he was in the habit of making tours through the villages of Galloway, painting miniatures. In 1841, he came to Edinburgh, where his talents ultimately won high reputation. His first picture that obtained great popularity was *The Cruel Sisters* (1851). Since then, F. has executed, among other works. *Shakspeare and his Contemporaries, The Cotter's Saturday Night,* and *The Soldier's Return;* and, since coming to London, 1864, *The Wappenschaw, The Old Style, Tam o' Shanter, Haddon Hall of Old, The Stirrup Cup, John Anderson my Jo, The Gamekeeper's Daughter,* and *The Hiring Fair.*

FAED, THOMAS: Scottish painter: b. 1826, at Burley Mill; brother of John F. One of his earliest efforts was a drawing (water colors) from the *Old English Baron.* In 1849, he became an assoc. of the Royal Scottish Acad., and soon afterward executed a very attractive work, *Scott and his Friends at Abbotsford.* In 1852, he removed to London, where his *Mitherless Bairn,* 1855, was declared by the critics, 'the picture of the season.' Among his subsequent works are *Home and the Homeless, The First Break in the Family, Sunday in the Backwoods, From Dawn to Sunset, Baith Faither and Mither.* and *The*

Last o' the Clan. F. was made A.R.A., 1859, R.A., 1864, and elected an honorary member of the Vienna Royal Acad. in 1875.

FAENZA, *fâ-ĕn'zâ:* town of Italy, 20 m. s.w. of Ravenna, on the left bank of the Lamone, in a beautiful plain. It is in the form of a square divided by four great streets, which meet in the centre. Among the chief buildings are an imposing cathedral, a fine market-place surrounded with arcades and adorned with a fountain, and numerous palaces and ecclesiastical edifices. Its manufacture of glazed and colored earthenware vessels, in Italy called 'Majolica,' and in France 'Faience' (q.v.), has declined in importance, and its chief industry now is the making of silk, linen, and paper. F., anc. *Faventia*, was at one period a town of the Boii, afterward a *municipium* under the Romans, and was annexed to the States of the Church in the 15th c. by Pope Alexander VI., in which condition it remained till 1860, when, with the Emilian provinces, it was annexed to the kingdon of Italy under Victor Emmanuel.—Pop. (1881) 13,998.

FÆSULÆ: see FIESOLE.

FAERY: see FAIRY.

FAG, v. *făg* [from *flag*, to become flaccid, to be weary: comp. Gael. *faigh*, to get, to obtain]: to work hard and slavishly; to make a drudge of any one; to become weary; to tire out; to fail in strength: N. a hard worker under another; a schoolboy who is the forced drudge of an elder pupil. FAG'GING, imp.: N. laborious drudgery. FAGGED, pp. *făgd.* FAG-END [the *lag-end*, the end which *flags* or hangs loose]: the remnant of cloth; the refuse or inferior part of anything; the untwisted end of a rope. TO FAG OUT, to untwist; to loose.

FAG'GING: usage peculiar to the great public schools of England. The origin of the practice cannot be traced. No school statutes refer to it, no school traditions speak of a time when it was not. The statutes of Eton College rather indicate precautions against it, for they ordain that there be 13 poor youths in the establishment to work for the college; but in Edward IV.'s time the college was much impoverished by royal depredations—the fellowships were cut down from ten to seven, and these *pauperes juniores* abolished. However, be the origin what it may, the institution exists in nearly the same form, in all the public schools—Eton, Harrow, Westminster, Winchester, and Rugby. Its main features are in every case much as follows: In each school there are two limits: the upper limit, extending to the bottom of the first one or two forms (the public school designation of classes), below which a boy may not fag; and the lower limit, comprising the last four or five of the lowest forms, above which a boy may not be fagged. The boys between these limits, as also those who, though comprised within the lower limit, have been more than a certain time in the school, are devoid alike of rights and duties in connection with this practice. The services of a fag are of two kinds—the one comprising his duties to a special master, to whom he has been assigned; the other consisting of those due to the whole of the upper boys. The former comprises such tasks as preparing his master's breakfast, stoking his master's fire, carrying his master's messages, and smuggling into the house little forbidden delicacies for his master's consumption, and in this instance, if detected, bearing his master's punishment. Those services which a lower boy owes to the whole of the upper boys, consist of attendance at the games. In the cricket season, the fags perform the functions of a net, and stand behind the wickets to stop the balls while their seniors are practicing; and at all seasons they are liable to the drearier task of waiting attendance on the racket-players, and retrieving the balls which have been 'skyed' out of the court. All cases of difficulty arising out of fagging are within the jurisdiction of the head-boy in the house, or the head of the school, and are settled by reference to him. Such are the main features of fagging at the present day—the idea pervading the institution being, that no boy should be liable to the performance of any duties really menial, but only such as, in the absence of the practice, would naturally be performed by each boy for himself. Many of the abuses of this practice which have from time to time been discovered and suppressed, afford whimsical illustrations of the peccant ingenuity of boy-nature. In one school, a senior boy had a study, but was not studious; he might have let it out to a younger boy in want of a crib to read in at a rent of five or ten shillings a term, but his mind soared beyond such paltry dealings; he conceived vaster and grander ideas of the management of his property; he set up a 'tap,' or beer-shop. He smuggled into his room a nine-gallon cask, called a 'governor.' There was a rapid succession of governors, and a brisk demand for beer; so he appointed his fag, a fine stout lad, as deputy-tapster to receive the coppers. The deputy grew attached to both his governors, and flourished long and happily in the faithful discharge of his duties. Another instance consisted of an equally whimsical and widely different exercise of power. A sixth-form boy, of High Church principles, made his fags, two very nice well conditioned young scholars, get up early and come to his room every morning before school for prayers

So prominent a feature in the constitution of English public schools as the institution of fagging, has, of course, received much criticism from educational reformers. The well-known author of the letters from Paterfamilias to the *Cornhill Magazine*, himself an Etonian, and one of those rare instances of a public-school man, dissatisfied with the recollections of his school-life, speaks of the practice with the greatest bitterness. 'Fagging,' say he, 'now happily almost obsolete, was also based upon the breeches pocket question. I used often to doubt, when called off from my studies, while a lower boy at Harchester, to mend my master's fire to prepare his meals, or to brush his clothes, whether a system which permitted and upheld such practices could really be beneficial to him or to me; but I never had any doubt that it was very beneficial to our tutor, inasmuch as it spared him the wages of some two or three servants, whose menial work was performed by the lower boys. Of course, the ingenuity of our masters discovered plenty of excellent arguments in support of practices so convenient to themselves; our parents used to be told that carrying coals for the upper boys, and toasting their muffins, made us helpful and docile, and took the nonsense out of bumptious lads; but such arguments would have applied just as aptly toward establishing the propriety of setting young noblemen and gentlemen to assist the scullion, or to sort out the dirty linen for the wash.' Doubtless many persons may be found to sympathize with this censure. They will tell us that much vigilance is necessary to prevent the abuse of the power of exacting casual service on the part of the senior boys, and that the rules of fagging, such as they are, give no adequate security against serious vexation and waste of a small boy's time. They say that the favorite apology, on the ground of its taking the conceit out of those who have been spoiled at home, is fallacious; that football and parsing are sufficient curatives of this evil tone of mind; and that if the necessity to render service to a senior takes the conceit out, the subsequent privilege of the early exercise of power only too rapidly pours it in again. They deny, also, the validity of one very favorite assertion of the upholders of the system, that the relation between master and fag often gives rise to pleasant intimacies between the upper and lower boys, intimacies beneficial to the latter; and they assert that the relation of master and fag has often marred what would otherwise have been a friendly recollection. The advocates of the system claim that the attendant evils are greatly exaggerated, and in some cases fictitious, while it is in many respects of essential service to the existence of a public school. They deny that it is upheld by the tutors from commercial considerations; since no really menial services are exacted, but only such as each boy might reasonably be expected to perform for himself, inasmuch as there are many men at the university who prepare their own breakfast, stoke their own fires, and go on their own errands. They claim also that the utmost facility exists on the part of the juniors for bringing any grievances before the proper authorities, and obtaining redress; and that the services of a fag are so light that he does not care or think about them. See the *Etonian,* a periodical published by some Eton boys, 1820, Oct.—1821, July; and the *Triumvirate,* a similar and more recent periodical from Harrow School. But the principal argument in the defense of the system must always rest, its supporters tell us, upon the security afforded by it against bullying. In public schools, where the ages of the boys vary from 10 to 20 years, a much greater liberty is given to the boys, and much greater confidence is reposed in them, than in private schools—the idea being, that their characters can be truly formed only by unrestricted intercourse among themselves, not hampered by the constant presence of an official. This constant presence of a master is, therefore, replaced by the traditions and constitution of the school, including the fagging system, in which each boy has his assigned position, and his definite rights and duties; a constitution, therefore, which each boy feels a personal interest in upholding, Such a society necessarily requires a provision for the relation between older and younger boys, between the weaker and the stronger; for, in the absence of this, the ordinary aspects of barbarism would be presented, and brute force alone be predominant.

To those not breathing an atmosphere of ancient usage, the practice seems a lingering barbarism, and the arguments in its behalf a plea for an abuse. See PENNALISM.

FAGIN, or FAGINE, n. *fā'jĭn* [L. *fagus,* a beech]: in *chem.*, the name given to a narcotic substance obtained from the nuts of the *Fagus sylvatica,* or common beech. It is a yellow mass, of a sweetish taste, easily soluble in water and alcohol, and sparingly in ether.

FAGOPYRUM: see BUCKWHEAT.

FAGOT, n. *făg'ŏt* [F. *fagot;* It. *fagotto;* W. *ffagod,* a fagot—from W. *ffassgu,* to bind, to tie: comp. Gael. *fag,* to leave, that which is left]: a bundle of sticks bound together for use, as fuel, etc.; a term of opprobrium or reproach among the lower classes to children and women; an old shrivelled woman: V. to form into fagots: ADJ. nominal; fictitious, as a soldier numbered in the muster-roll, but not really existing; applied to the vote of a non resident elector—now usually restricted to a vote on a qualification created to promote party purposes. FAG'OTING, imp. FAG'OTED, pp.

FAGOTTO, n. *fa gŏt'tō* [It.]: the Italian name for the bassoon, by which it is generally known in instrumental scores. The name is said to be derived from its resemblance to a fagot or bundle of sticks.

FAGS, n. *făgz* [etym. doubtful]: a disease in sheep.

FAGUS: see BEACH.

FAHLORE, n. *fâ'lōr*, or FAHLERZ, *fâ'lrēz* [Ger. *fahl*, ash-colored; *erz*, ore]: gray copper-ore: the type of a family of minerals containing copper; tetrahedrite, which see under TETRAHEDRON.

FAHRENHEIT, *făr'ĕn-hīt or fâr'ĕn-hīt*, GABRIEL DANIEL: 1686, May 14—1736, Sep. 16; b. Dantzig: improver of the thermometer and barometer. Having travelled through Germany and England, enlarging his scientific knowledge, he settled in Holland. In 1720. he conceived the idea of using quicksilver instead of spirits of wine in thermometers, by which the accuracy of the instrument was much improved: see THERMOMETER. In 1724, F. was elected a fellow of the Royal Soc. of London; and the *Philosophical Transactions* of that year contain several papers by him.—On the F. thermometer scale, the freezing-point of water is marked 32°, and the boiling-point 212°.

FAIDHERBE, *fā-dĕrb'*, LOUIS LÉON CÉSAR: French general: b. Lille, 1818, June 3; d. 1889, Sep. 28. He was educated in the Polytechnic School, performed his first military service in Africa, became gov. of Senegal 1854, gen. of div. 1870; and commanded the army of the north in a number of engagements with the Prussians 1870, Dec. —1871, Jan. On 1871, Jan. 19, he was defeated by Gen. von Goeben at St. Quentin, owing to his lack of artillery and the inexperience of his army. He was a warm Gambettist, became a member of the national assembly, retired from political life on the triumph of Thiers's govt., and was appointed grand chancellor of the Legion of Honor. He published numerous scientific papers in the *Annuaire du Sénégal* (1859, 60, 61); and in the *Bulletin de la Société de Géographie*, of *Chapitre de Géographie sur le Nord-Ouest de l'Afrique* (1864); *Collection complète des Inscriptions Numidiques* (1870); and *Campagne de l'Armée du Nord* (1871). He is noted as a milit. organizer, geographer, ethnographist, and linguist.

FAIENCE, n. *fā-yăngs'* [F. *faïence*—said to be from *Faenza*, in Italy, where first made]: general term for all sorts of glazed earthenware and porcelain; but applied specially to a rich painted kind. The origin of the name is disputed. Some derive it from Fayence, a small town of Provence, others from Faenza, a city of Italy; while certain writers consider that the isle of Majorca is at least the place where it was originally manufactured, in proof of which they appeal to the fact, that the Italians still call Faience *Majolica or Mayolina.*

FAI-FO, *fī'fō:* seaport of Anam (q.v.); one of the more considerable marts of the empire. It stands on a river near its mouth, communicating with Turon, 15 m. n. by a canal. It exports sugar and cinnamon, its principal trade being with China. Pop., mostly Buddhists, 15,000.

FAIL, v. *fāl* [F. *faillir*, to err, to fail—from L. *fallĕrĕ*, to deceive: W. *ffaelu*, to fail: Ger. *fehlen*, to miss: Dut. *fælen*, to slip: comp. Gael. *feall*, to deceive, to betray]: to neglect to aid or supply; to disappoint; to fall short; to become deficient; to decay or decline; not to succeed in a design; to be entirely wanting; to become weaker; to desert; to become bankrupt; in *OE.*, to deceive: N. omission; non-performance. FAIL'ING, imp.: N. a fault; a weakness; an imperfection or defect. FAILED, pp *fāld.* FAIL'INGLY, ad. *-lĭ.* FAILURE, n *fāl'ūr*, an unsuccessful attempt; deficiency; omission; total defect; decay; insolvency.—SYN. of 'failing, n.': failure; frailty; foible; infirmity; fault; deficiency; lapse; omission; non-performance; decay; defect.

FAIL, a. *fāl* [Gael. *fal*, a pen fold, a hedge]: in *Scot.*, applied to a dike or wall of turf.

FAILLE, n. *fāl* [F.]: a soft, inexpensive silk material used for evening dresses, and for trimmings of bonnets, etc.

FAILLIS, n. *fāl'ĭs* [F.]: in *her.*, a failure or fracture in an ordinary, as if it were broken, or a splinter taken from it.

FAIN, a. *fān* [OF. *fain*, for *faim*, hunger, vehement desire—from L. *fămēs*, hunger: Icel. *feginn*, glad: comp. Gael. *fan*, prone]: glad to do; eager; obliged or compelled; in *OE.*, joyful; glad: AD. gladly. FAIN'NESS, n. state of being fain or desirous to do. FAIN'ING, a. in *OE.*, expressive of desire.

FAINÉANTS ROIS, *fā-nā-âng rwâ* [Fr. 'Do-nothing Kings']: sarcastic designation of the later Merovingian sovereigns of France, under whose name the famous Mayors of the Palace really governed the country. The first of the F. R. was Thierry III., nominally monarch of Burgundy, Neustria, and Austrasia the others were Clovis III., Childebert III., Dagobert III; Chilpéric II., Thierry IV., and Childéric III. The last of those was dethroned in 730, and was shut up in a monastery, and Pepin *le Bref*, Mayor of the Palace, caused himself to be formally proclaimed king. This was the end of the Merovingian dynasty; it is curious that Louis V., last of the Carlovingians, descendant of Pepin *le Bref*, also received the contemptuous epithet of *Fainéant* as those monarchs had who were dethroned by his ancestors.

FAINT, a. *fānt* [OF. *feint*, feigned; F. *vain*—from L. *vānus*, empty, feeble: W. and Bret *gwan;* Gael. *fann*, weak, faint]: weak; exhausted; inclined to swoon; not bright, as a color; not loud; timorous; cowardly; slight or imperfect, as a faint resemblance, a faint smell; feeble, as a faint resistance: V. to waste away quickly; to swoon; to be weak; to become weary; to become senseless and motionless; to sink into dejection; to lose courage; in *OE*, to cause to faint FAINT'ING, imp.: ADJ. languishing; sinking: N. temporary loss of motion and sensation. FAINT'ED, pp. Faint'ingly, ad. *-lĭ.* Faint'ish, a. somewhat faint. Faint'ishness, n. state of being somewhat faint. Faintly, ad. *-lĭ.* Faint'ness, n. feebleness; want of strength. Faint-hearted, a. *-hârt'ĕd,* yielding to fear; dejected; timorous. Faint-heart'edly, ad. *-lĭ.* Faint-heart'edness, n. Faints, n. plu. *fānts,* the impure spirit which comes over first and last in the distillation of whisky; the weak or impure remains of the whisky-still.

FAINT'ING, or Syn'cope: condition in which, from a sudden mental or bodily impression, the circulation of blood is temporarily arrested or very much diminished in force and volume, the respiration and the functions of the nervous system likewise being suspended. The indications of F. to a bystander are chiefly a sudden pallor, accompanied by loss of power over the limbs, with disappearance of the pulse and movements of respiration; the eyes are commonly half open or closed, the countenance bloodless, but quite at rest, and not indicative of suffering or disturbance; the flaccid, motionless condition of all the limbs also tends to distinguish simple fainting from epilepsy, and the other diseases attended with spasm; while the vanishing of the color, and the suppression of the pulse, make a marked distinction between F. and catalepsy (q.v.), and other forms of hysteria (q.v.); with which disorders, however, F. may in some cases be associated. The mode of origin of F., and the study of its phenomena, alike lead to the conclusion that it is primarily an impression upon the nervous system, much of the same nature as the collapse, or shock of a severe bodily injury; this reacts, in the first instance, on the heart, and through the circulation on all the other functions of the body. Fainting may end in death, if too prolonged, or if associated with disease of the internal organs; especially of the heart; hence a particular variety of fainting has been separately studied, and named *Syncope anginosa,* or otherwise *Angina pectoris:* see Heart, Diseases of the. Ordinarily, a person who faints from mental emotion, a hot and close atmosphere, or other transient cause, is readily restored by being laid on the back with the head low, and surrounded by abundance of cool fresh air Any tight articles of dress should be loosened, and a stream of cold air, or a little cold water, should be directed to the face and neck, so as to rouse the respiratory movements. It is common, also, to apply ammonia or aromatic vinegar to the nostrils; but a more effective way of exciting the respiration is to compress the ribs, and allow them to expand again alternately, so as to imitate the natural movement. Care should be taken to ascertain that there is no obstruction in the throat or air-passages, as suffocation from mechanical causes has been mistaken for fainting, and the real origin of the mischief overlooked, with fatal consequences. Should all other means fail, galvanism (q.v.) will sometimes succeed in restoring the respiration and heart's action.

FAIOUM': see Fayum.

FAIR, a. *fär* [Icel. *fagr* bright: AS. *fæger*, beautiful:

Gael. *fair*, the rising or setting of the sun]: beautiful; free from any dark hue; white; spotless; favorable; fine, as weather; prosperous; frank; civil; just; equitable; used in a slightly depreciatory sense, as *a fair copy*—that is, one not *particularly good:* N. the female sex; in *OE.*, for 'fairness': AD. openly. FAIR'LY, ad. justly; good in some degree; completely. FAIR'NESS, n. the quality of being fair; equity; freedom from spots or blemishes; beauty; candor; freedom from disguise. FAIR'ISH, a. *-ĭsh*, reasonably or moderately fair. FAIR'ISHLY, ad. *-lĭ*. THE FAIR SEX, the female sex. A FAIR FIELD, open space for action or operation; freedom from obstructions. FAIR-FOLK, or FARE-FOLK, n. *-fōk*, the fairies: see FAIRY. FAIR-SPOKEN, bland; civil; courteous. FAIR-GRASS, n. in *bot.*, *Potentilla anserina; Ranunculus bulbosus.* FAIR-HAIR, n. [Sc.]: the tendon of the neck of cattle or sheep. FAIR-HAIRED, having light hair. FAIR-LEAD, n. in *naut.*, a term applied to ropes as suffering the least friction in a block, when they are said to lead fair. FAIR-LEADER, n. in *naut.*, thimble or cringle to guide a rope; a strip of wood with holes in it, for running rigging to lead through. FAIR-LEATHER, n. *-lĕth'ėr*, leather finished in the natural color or that imparted by the tanning process; free from any special coloring. FAIRWAY, n. the navigable part of a river. TO BID FAIR, to be likely. TO KEEP FAIR, to be on good terms. TO SPEAK FAIR, to address with courtesy and frankness. FAIR PLAY, just and impartial treatment. FAIR-MAIDS OF FEBRUARY, n. in *bot.*, *Galanthus nivalis*, alluding to the blossoming of the snowdrop about February 2, or Candlemas Day. FAIR-MAIDS OF FRANCE, n. in *bot.*, *Saxifraga granulata; Achillea Ptarmica; Ranunculus aconitifolius; Lychnis Flos-cuculi.* FAIR-MAIDS OF KENT, n. in *bot.*, the double-flowered variety of *Ranunculus aconitifolius*. *Note.*—In the sense of 'equitable, just,' FAIR may be connected with Gael *firean*, righteous, just; *fearr*, better, best—see Dr. C. Mackay.—SYN. of 'fair, a.': reasonable; moderate; middling; candid; open; ingenuous; clear; honest; direct; impartial; unblemished; handsome; cloudless; propitious; favorable; upright; pleasing; distinct; legible.

FAIR, n. *fär* [F. *foire;* It. *feria*, a market held on a holiday—from L. *ferĭæ*, holidays: comp. Gael. *foir*, a crowd of people; *faidhir*, a market]: a market held at stated periods (see FAIRS). FAIRING, n. *fär'ĭng*, a present bought at a fair.

FAIR, or BENMORE', HEAD: promontory of the n. coast of Antrim, Ireland, opposite Rathlin Isle, which is four m. to the n.west. It rises 636 ft. above the sea. The lower 300 ft. consists of carboniferous strata, overlaid by greenstone columns, 20 to 30 ft. thick, and 280 to 300 ft. high. It is perpendicular to the sea, but slopes to the land. The table-land on the top is covered with rich pasture, and presents fine views of the neighboring coast, Rathlin Isle, and the Argyleshire Highlands, 16 m. distant. On the promontory are two small lochs, 500 ft. above the sea.

FAIRBAIRN, *fär'bärn*, ANDREW MARTIN, D.D., LL.D.:

Scottish Congl. theologian: 1838, Nov. 4— ————; b. near Edinburgh. Having studied at the Univ. of Edinburgh, he accepted a pastorate at Bathgate, Linlithgow, Scotland, and afterward went to Germany, where he continued his studies at Berlin. On his return to Scotland he preached at Aberdeen, and at the same time became a noted contributor to the press of essays on theological subjects. He was chosen principal of the Congl. college at Airedale 1878, and in the same year the Univ. of Edinburgh conferred on him the degree D.D. He was Muir lecturer on comparative religions, 1881–83. In 1883, he was chairman of the Congl. Union of England and Wales, and since 1888 he has been principal of Mansfield Coll., Oxford. He visited America in 1890, and in 1892 delivered the lectures at Yale Divinity School on the Lyman Beecher foundation. Among his published works are *Studies in the Philosophy of Religion* (1876); *Studies in the Life of Christ* (1880); *The City of God* (1882); *Christianity in the First and Nineteenth Centuries* (1883); *Religion in the History and Life of To-day* (1884); and *The Place of Christ in Modern Thought* (1893).

FAIRBAIRN, Sir WILLIAM, LL.D., Bart.: 1789–1874, Aug.; b. Kelso, in Roxburghshire, Scotland. After a little schooling he was apprenticed to an engine-wright at Percymain Colliery, North Shields; then wrought for two years in London; and then visited many places in England, Wales, and Ireland, working a short time at each, observing the various practices of different localities. Eventually, he commenced business on his own account in Manchester, 1817, without money or helpful connections. The first great improvement introduced by F. was the substitution of iron for wood in the shafting of cotton-mills, and the substitution of light for heavy shafting of metal. This economized cost, and enabled the motion to be speeded from 40 to 160 revolutions per minute. F. was among the earliest iron ship-builders, and originated various improvements in their construction, and his firm built several hundred vessels.

In 1834–5, F. was engaged in seeking the cause of defects in the iron produced by hot-blast furnaces, and in testing the strength of various kinds of iron, the tenacity of boiler-plates of various thicknesses, and the best mode of riveting.

The first idea of a tubular bridge across the Menai Strait is due to Robert Stephenson, but its realization is due to F. Stephenson's idea was a circular tube, supported by chains: but the Britannia and Conway bridges are rectangular structures, strengthened by a series of cells at the top and bottom, and without chains or any other support from pier to pier. The present form results from a long series of experiments upon model tubes—circular, egg-shaped, and rectangular. F. erected more than a thousand bridges on this principle: see TUBULAR BRIDGE. F. was created a baronet 1869. He published numerous works and papers on iron bridges, boilers, mills, etc. He was member of many scientific societies. See his Life by W. Pole (London 1877); and Smiles's *Lives of the Engineers.*

FAIRBANKS, Charles Warren: American lawyer and statesman: b. near Unionville Centre, Union county, Ohio, 1852, May 11. After obtaining his early education in the district schools he attended the Ohio Wesleyan University, whence he was graduated in 1872. While in college he edited the college journal, the 'Western Collegian.' He then went to Cleveland where he became an Associated Press agent, in the meantime studying law. In 1874 he was admitted to the bar of the Supreme Court of Ohio at Columbus, and removed to Indianapolis, Ind., in the same year, where he soon acquired a large practice and where he has since lived. In 1892 and again in 1898 he was chairman of the Indiana State Convention; in 1893 was defeated, as the Republican nominee for U. S. Senator, by David Turpie, the Democratic candidate. In 1896 he was a delegate to and temporary chairman of the Republican National Convention at Saint Louis; in 1897 was elected Senator and was re-elected at the expiration of his term. In 1898 he was appointed a member of the United States and British Joint High Commission which met in Quebec for adjusting Canadian questions and disputes. In Nov., 1904, he was elected Vice-President of the United States.

FAIRBANKS, *fār'bănks,* Erastus, ll.d.: 1792, Oct. 28—1864, Nov. 20; b. Brimfield, Mass.: manufacturer. He was educated for the law, but abandoned it on account of weak eyes, and removing to St. Johnsbury, Vt., formed a partnership with his brother Thaddeus, and began manufacturing cast-iron plows 1824. In 1831 the brothers began making the celebrated scales, invented by Thaddeus F. Their works became greatly extended and they amassed wealth. Erastus was a member of the Vt. legislature 1836–38, and gov. 1852–55, 1860–61. He was a liberal promoter of religious and charitable enterprises.

FAIRCHILD, *fār'chīld,* Charles Stebbins: lawyer: b. Cazenovia, N. Y., 1842, Apr. 30. He graduated at Harvard 1863, and its law school 1865; was admitted to the bar the latter year; joined the law firm of Hand, Hall, Swartz, and F.; was appointed dep. atty.-gen. of N. Y. 1874; elected atty.-gen. as a democrat 1876; settled in New York to practice 1880; was appointed asst. sec. of the treas. dept. 1885; and was appointed sec. of the treas. by Pres. Cleveland to succeed Daniel Manning 1887, Mar. 31.

FAIRCHILD, Edward Henry: educator: b. Stockbridge, Mass., 1814: brother of James Harris F., d.d. He was educated with his two brothers and three sisters in Oberlin College; took the theol. course with his brothers; became a lecturer for the American Anti-slavery Soc. 1835; was ordained pastor of the First Congl. Church at Cleveland 1840; continued in the ministry at various places till 1852, when he was appointed principal of the preparatory dept. of Oberlin College; and after 16 years' service as principal and financial agent was elected pres. of Berea College, Ky., 1868.

FAIRCHILD, James Harris, D.D.: ex-pres. of Oberlin College: b. Stockbridge, Mass., 1817, Nov. 25 He was removed by his parents to Brownhelm, O., when an infant; graduated at Oberlin College 1838, was tutor there 1838–42, ordained as a Congl. minister 1841, prof. of languages 1842–47, prof. of mathematics 1847–58, prof. of moral philosophy and theol. 1858 to the present time, and elected pres. of the college 1866. He resigned the presidency 1889. F. received his degree from Hillsdale College 1864. His publications include *Moral Philosophy* (1869, revised ed. 1892); *Oberlin, the College and the Colony, 1833–83* (1883); editions of *Memoirs of Rev. C. G. Finney* (1876), and *Finney's Systematic Theology* (1878); *Elements of Theology* (1892).

FAIRCHILD, Lucius: lawyer: b. Kent, O., 1831, Dec. 27. He received a public school and collegiate education; removed to Madison, Wis., 1846; made an overland ox team journey to the Cal. gold mines 1849; returned to Madison, was elected clerk of the circuit court and began studying law 1858; and was admitted to the bar 1860. In 1861 he served as capt. 1st Wis. vols. in the 3 months' campaign, and at its close was appointed capt. 16th U. S. inf. and maj. 2d Wis. inf.; in June he was promoted lieut.-col.; and July commanded the 2d and 7th Wis. regts in the 'iron brigade' in the first Bull Run (q.v.) battle. He served through the McClellan and Pope campaigns: took part in 14 battles and important engagements; lost his left arm while leading a charge at Seminary Hill, Gettysburg, and was promoted brig.gen. 1863, Oct. 19. In the following month he was elected sec. of state of Wis., and resigned his army commission to assume his new office 1864, Jan. 1 In 1865 he was elected gov., and was twice re-elected. In 1872 he was appointed U. S. consul at Liverpool; 1878 was transferred to Paris as consul-gen.; 1880 was appointed U. S. minister to Spain: 1881 resigned; 1882-3 was pres. of the International Exposition of Railway Appliances at Chicago; and 1886 was elected commander-in-chief of the Grand Army of the Republic. He d. 1896, May 23.

FAIRFAX, *für'fäks*, EDWARD: translator of Tasso's *Jerusalem Delivered:* natural son of Sir Thomas Fairfax of Demen, in Yorkshire; year of birth unknown, supposed to have died soon after 1631. He spent his life at Fuystone, in the forest of Knaresborough, in competence and ease, amid rural scenes, and with ample command of the means of study. His celebrated translation of Tasso was made in the reign of Queen Elizabeth, to whom it is dedicated. The first edition bears date 1600. For poetical beauty and freedom, it has had universal praise. Dryden ranked F. with Spenser as a master of English, and Waller said that he derived from him the harmony of his numbers. F. wrote also a treatise (pub. 1858–59) on *Demonology*, in which he was a believer—a credulity probably helpful in the translation of a work full of the machinery of enchantment. Hence Collins says regarding him—

> Prevailing poet, whose undoubting mind
> Believed the magic wonders which he sang.

FAIRFAX, JOHN CONTEE, Lord: 11th Baron F. of Cameron, in the Scotch peerage: b. Vaucluse, Va., 1830, Sep. 13: physician. He was a younger son of the Hon. Albert F., received a medical education and practiced with success at Woodburne and Northampton, Md., married a daughter of Col. Edward Kirby, U.S.A., 1857, and succeeded to the title 1869, on the death of his brother Charles, 10th Lord F., formerly chief clerk of the supreme court of Cal. In 1887 he received an invitation from Queen Victoria to be present, with his fellow peers, at her jubilee in Westminster Abbey, but as he had always refused to assert his title he declined.

FAIRFAX, THOMAS, Lord: general of the parliamentary troops in England during the civil wars under Charles I.: 1612, Jan. 17—1671, Nov. 12; b. Denton, Yorkshire; son of Ferdinando, Lord Fairfax. He studied at St. John's College, Cambridge, and afterward served as volunteer in Holland, under Lord Vere, whose fourth daughter, Anne, he married soon after his return to England. On the outbreak of the civil war 1642, F. warmly espoused the cause of the parliament, and was appointed cavalry-gen. under his father, who commanded the parliamentary forces in the north. He distinguished himself by valor, prudence, and energy, and when the Earl of Essex resigned his office of gen. of the parliamentary forces, 1645, F. was appointed in his place. In a short time, Cromwell, who had been appointed lieut.gen., obtained unbounded influence over him; and from this time, though nominally head of the parliamentary forces, he really acted a secondary part. At last, 1650, June, he refused to march against the Scots, who had proclaimed Charles II. king, and Cromwell was appointed commander-in-chief in his stead. F. now withdrew into private life, and did not come forward again until after the death of Cromwell, when he showed a zeal for the restoration of the king, gathered troops for that purpose to assist General Monk against Lambert; and was appointed one of the delegates dispatched to the Hague 1660 to promote the return of Charles II. He died at Nunappleton. F. had some taste for literary pursuits, and wrote several works, prose and poetic. See his Correspondence (4 vols. 1848-9), and Life by C. R. Markham (1870).

FAIRFAX, THOMAS, Lord: 1691-1781, Dec. 12; b. England: grandson of Lord Culpepper, colonial gov. of Va.; founder in Va. of the family of F. He was educated at Oxford Univ.; wrote some time for the London *Spectator;* removed to Va. to look after the estate of 5,282,000 acres between the Potomac and Rappahannock rivers inherited from his mother, 1739; and after visiting England established himself permanently at Greenway Court, 12 m. from Winchester, 1745. Anne, daughter of his cousin, Sir William, married Lawrence, brother of George Washington, and F. becoming thus acquainted with the future gen., employed him to survey his great domain, 1748. During the revolutionary war he was a firm loyalist, yet such were his noble qualities that his property was respected both by the Americans and by the British during the struggle. He survived the mortification of Cornwallis's surrender at Yorktown only a few weeks, and after the war his property was confiscated.

FAIR HAVEN (Conn.): see NEW HAVEN.

FAIR HA'VENS: harbor on the s. of Crete, near the port of Lasæa, ruins of which were discovered by an English yachting party 1856. The evangelist Luke is the only ancient writer who mentions it (Acts xxvii. 8). When the apostle Paul and other prisoners were being taken by ship to Italy, they sailed close to the F. H., where Paul urged the master of the ship to take refuge as he perceived that the voyage would be disastrous. The master preferred the haven of Phenice, which was more commodius to winter in, and on the way thither the Euroclydon tempest arose and wrecked the ship on the island of Melita.

FAIR ISLE: solitary isle in the Atlantic, 25 m. s.s.w. of Shetland; 4 by 2½ m. in extent, rising 708 ft. above the sea, with high rocky cliffs and promontories. It affords copper ores, and hand-shaped sponges called 'trowie gloves.' The people are chiefly fishers. At Stromceiler Creek, was wrecked, 1588, the Duke of Medina Sidonia, admiral of the Spanish Armada. He escaped, after most of his crew were murdered. From the Spaniards who remained, the natives acquired a knowledge of the art of making woolen articles, such as caps, mittens, and stockings, in divers colors, which are still a staple for export.—Pop. (1881) 214.

FAIR OAKS, BATTLE OF: see SEVEN PINES, BATTLE OF.

FAIRS [see FAIR]: great periodical markets, some of which are devoted chiefly to one kind of merchandise, while others, of wider scope, afford opportunity for most of the sales and purchases of a district. Fairs have long been regularly held in most parts of Europe, and in many parts of Asia; but as they belong to a state of things which is passing away, they have not been established or have not acquired importance in America. In Europe, they appear to have originated in the church festivals, which afforded convenient opportunities for commercial transactions, the concourse of people being such as took place upon no other occasion. This origin of fairs is commemorated in their German name *Messen*, which is derived from the word employed to denote the most solemn part of the church service: see Mass. Some festivals, from circumstances of place and season, speedily acquired greater commercial importance than others, and drew buyers and sellers from remote countries. When the ordinary means of communication and of exchange of commodities were very limited, fairs were of great use. Princes and the magistrates of free cities found it to their advantage to encourage them, and granted them many privileges. Courts of summary jurisdiction—commonly called *pié poudre*, from the dusty feet of the suitors—were established distinct from the ordinary courts of the county or city, for the determination of questions which might arise during the fair. In connection with all this, the practice was necessarily adopted of publicly proclaiming the commencement and duration of the fair, and this still subsists, as in the annual fairs of some great cities of Britain, where scarcely any other vestige remains of the old privileges of fairs, and where they might with advantage to all the interests of society, be now abolished.

In w. Europe, the goods exposed for sale at fairs are chiefly those in respect of which there is frequent change of fashion. Provisions are seldom an article of merchandise in them, though in some parts of the continent persons of all ranks still wait for the great yearly fairs to make their principal purchases of manufactured articles. It is otherwise, however, in places on the outskirts of civilization; and almost all the produce of great provinces is sold, and all that their inhabitants require is bought at such fairs as those of Kiachta and Nishnij-Novgorod. The British fairs really of much use at the present day are chiefly for the sale of cattle; of these some held on the borders of the Scottish Highlands, and elsewhere in Scotland, are frequented by buyers and sellers from all parts of the kingdom, and bring together the breeders of cattle and the graziers, by whom the animals are to be fed for the butcher. Such are the fairs or trysts, as they are called, at Falkirk, Doune, Edinburgh, etc. At other great yearly fairs in the south of Scotland, lambs and wool are sold; and fairs chiefly for the sale of the annual produce of pastoral districts are common in many parts of the world.

The greatest fairs in the world are the Easter and Michaelmas fairs at Leipsic. These are not to be confounded with the Leipsic Book-fair, which is chiefly an occasion for the settlement of accounts among booksellers and publishers. Next to the Leipsic fairs, those of Frankfurt-on-the-Maine are the most important in Germany. The fairs of Frankfurt-on-the-Oder, and of Brunswick in Germany, of Zurzach in Switzerland, Pesth in Hungary, Sinigaglia and Bergamo in Italy, Beaucaire and Lyon in France, and Nijni-Novgorod (q.v.) in Russia, are among the most important in Europe. After the great fairs of

Leipsic, that called the Fair of St. Peter and St. Paul at Nijni-Novgorod is the greatest in the world, and is frequented by buyers and sellers from different parts of Europe, and of n. and central Asia. The fairs of Tanta in Upper Egypt, of Kiachta in the s. of Siberia, of Irbit, also in Siberia; of Mecca in Arabia, and of Hurdwar in w. India, also are of very great importance, and are the most considerable out of Europe. That of Kiachta is a sort of barter-market, where almost all the commercial transactions between the Russian and Chinese empires take place. The fairs in Britain have latterly in some cases degenerated into scenes of merriment, such was Bartholomew Fair, London, now extinct; also Greenwich Fair, Glasgow Fair, and Donnybrook Fair, near Dublin—this last likewise either extinct, or nearly so. The boisterous merriments at these fairs were of old the devices employed as likely to attract a great concourse of people; hence each fair had its sport or drollery — football, wrestling, yawning, cudgel-playing, throwing at cocks, sack-races, flying dragons, grinning through horse-collars, mock-giants, monstrous fishes, soaped pigs, smoking-matches, eating hot hasty-pudding, whistling, wheelbarrow races. M. Bottin, author of a statistical *View of the Fairs of France*, says that on examining his work it will appear that they were placed for the most part on the frontiers of the kingdom, or on the marches of ancient provinces; or at the foot of high mountains, at the beginning or end of the snow-season, which for months shuts up the inhabitants in their valleys; or in the neighborhood of famous cathedrals or churches frequented by flocks of pilgrims; or in the middle of rich pastures. An old fair in the n. of Scotland, in June, when the nights are very short, began at sunset, and ended an hour after sunrise: it was called 'Sleepy Market.'

FAIR TRADE: term introduced into the later discussion in England on the free-trade policy, to denote a mild modification of the protective system, based on international reciprocity, i.e., on free trade only with nations that grant similar privileges. In Britain, F. T. is sometimes also associated with projects of imperial federation; and then it included differential treatment by the mother country in favor of the Brit. colonies as against foreign nations.—See FREE TRADE: TARIFF: etc.

FAIRY, n. *fä'rĭ* [OF. *faerie*, enchantment: It. *fatare*, to charm as witches do: Sp. *hadar*, to divine: F. *féerie*, witchery—from *fée*; OF. *fae*, an elf, at fairy (see FEY)]: an imaginary good or bad being, said to influence the fate of men: ADJ. of or pert. to fairies. FAIRY-LIKE, like a fairy. FAIRY-LAND, the supposed abode of the fairies. FAIRY-RINGS: see below. FAIRY-BEADS, n. *bēdz*, in *geol.*, the small perforated and radiated joints of the fossil *Crinoidea*, found abundantly in the shales and limestones of the carboniferous or mountain limestone formation; also called St. Cuthbert's Beads. FAIRY-GREEN: see FAIRY-RINGS FAIRY-LINT, n. in *bot.*, *Linum catharticum.* FAIRY-MONEY, n. treasure-trove; money given by the fairies was said to change after a time into withered leaves or rubbish; hence, something that becomes valueless. FAIRY-PURSES, n. in *bot.*, a kind of fungus. It is like a cup, or old-fashioned purse, with small objects inside; probably *Nidularia campanulata.* FAIRY-SHRIMP, n. in *zool.*, a species of phyllopodous crustacean, *Chirocephalus diaphanus*, occasionally found in fresh-water ponds. It is about one inch in length, and nearly transparent. FAIRY-THIMBLES, or FAIRY-WEED, n. in *bot.*, *Digitalus purpurea.* FAIRY-STONES, the flinty fossil sea-urchins found in the chalk of the south of England; concretionary nodules of clay found in streams and river-courses.—*Fairies*, or Elves were supposed supernatural beings, generally of human form but diminutive size. A belief in them has been among the superstitions of a greater portion of the European nations. The word *elf* is from Anglo-Saxon *ælf*, which corresponds to Danish *alf*, Icelandic *álfr*, and German *alp;* but the Germans adopted, in the 18th c. *elf* and *elfe*, from the English for the same idea. Fairy is properly enchantment, or the realm of fairy spirits, *fay* being originally the name of the sprites themselves. Fay (Low Latin *fata*, fairy; French *fée*) is from Latin *fatum*, fate, and anciently meant the goddess of destiny. From the Old French *fae* (=*fée*) comes *faerie*, enchantment; whence fairy. The Celtic fees or fairies are undoubtedly relics of those *matres* and *matronæ*, which appear on Gallo-Roman inscriptions as objects of popular belief. After the transfusion of the Teutonic and southern nations, the northern elves (originally of two kinds—the light elves, or elves proper, and the dark elves, or dwarfs) became mingled with their Celtic kindred the fairies in inextricable confusion.

It is generally difficult to give any scientific definition of the nature of a superstition, because its phenomena are continually varying with the time, place, and other conditions. The fairy superstition especially defies definition, because it was the peculiarity of the creatures to whom it referred that they followed no regular law, human or divine, but obeyed the impulse of their own caprice; hence every fairy tale differs from another. Still, there are distinctions and specialities that emerge in the examination of a large number of these narratives. In the first place, the superstition belongs peculiarly to modern Europe. We find nothing like it among the idolatries of the heathen referred to in Scripture, nor does the word occur in the

English Bible, or its equivalent in the original texts. In classical mythology, there is nothing nearer to it than the nymph of the fountain or grove among the Greeks. In the next place, it may be determined that the varieties in the superstition correspond, in some measure, with those of the physical geography of the districts in which it prevails. In those parts of the world where there are mountains, mists, dangerous morasses, cataracts, and stormy oceans, all superstitious beliefs relating to supernatural agencies, are naturally exaggerated, and, from the appalling dangers to which they relate, the belief takes deep root in the common mind. Accordingly, in flat and well cultivated countries like England, the fairy superstition is simple and homely, connecting itself with matters of domestic routine, such as the sweeping of the dwelling-house, the skimming of the milk, the preservation of the butter, and the like; while in the Scotch Highlands and Scandinavia the fairy folk are connected with storms and convulsions, betray people to their death, fly away with them into the infinite cloud-land, or lead them through endless caverns within the earth. It has been observed, as a further distinction, that the fairies of the German or Teutonic tribes are more harsh, fierce, uncomely, or deformed than those of the Celtic nations, which have a tendency rather to the aërial and the graceful. Still, there is so great an amount of common characteristic in the superstition throughout Europe, and its peculiarities have been found so much more emphatically displayed in Scandinavia than elsewhere, as to have suggested to some the view, that the superstition is a remnant of the old mythology of the northern nations, communicated by them to a greater or less extent to all the countries over which their vikings carried their ravages.

There is a further distinction—at least in Britain—between the fairies of poetic and heroic literature and those of popular belief—the former being princes and princesses of chivalry, distinguished from human beings only by their superhuman superiority in all the qualities which elicited respect in the age of chivalry; while those of popular belief are small in stature, sometimes decrepit and endowed with dispositions generally allied more to malignity than to magnanimity. It is common to all classes of them to be deemed under the condemnation of the religion of the gospel, and to be either conditionally or unconditionally excluded from the abodes of the righteous in the next world. In Ireland and the Highlands, they have been spoken of as a wandering remnant of the fallen angels. It is sometimes a symptom of geniality and kindliness in a people when their fairies are supposed to be capable of earning their own redemption. Sometimes they are supposed to be human beings, metamorphosed or disembodied, and this form of the superstition has made fairyland a place of purgation for those whose sins have condemned them to it. The analogy is carried out in the belief that the services of the living can extricate the souls so situated; but it is rather through dexterity and courage than pure piety that the feat is achieved, and the rescues from fairyland form some of the most wild and exciting of the elfin narratives—as, for instance, the strange, wild ballad of *Tamlane.*

There is still another broad distinction of fairies into those that dwell in the upper air and those that dwell within the bowels of the earth, while a third class frequent the waters. The surface of the earth on which mankind reside is not deemed the proper place of any class of elves except on special occasions. The Scandinavians called the fairy inhabitants of the air white elves; those of the earth, black. Whatever was genial, light, playful, and benevolent in the superstition, clustered round the former; the latter did all the work that was dark, cruel, and rapacious. Naturally enough, the black or subterranean kind frequented mining districts, where they might be seen extracting the ore for themselves, and thus unwittingly leading the miner to rich veins of metal. They might be seen in an occasional peep through an aperture of a hill in their underground retreats, in chambers supported on jasper columns, where they were stowing away their hampers of gold and silver—for they were generally held to be very affluent. Some of the most exciting tales about the German gnome, and the Irish leprechaun, a creature of the same kind, are founded on the efforts of adventurous mortals to get possession of their riches. There exists a legend, in nearly identical terms in several countries, which connects some piece of valuable plate belonging to a church with the underground fairies. The story of the horn of Oldenburg is a type of these narratives. The pictures of it represent it as a beautiful drinking vessel, in the shape of a horn, exquisitely decorated with finest fanciful silver-work, in the style contemporary with the richest Gothic architecture. The legend is, that Otho of Oldenburg, exhausted with hunting, and very thirsty, exclaimed: 'O God, would that I had a cool drink!' Thereupon there appeared before him, as if coming out of the rock, a lovely maiden, who offered him a drink in the fairy horn. He made off with it, and saved himself from evil consequences by bestowing it on the church. Hence these relics are generally in churches; but one of them is, or lately was, in the possession of an English family, and as their prosperity was traditionally believed to depend on retaining it, it was called 'The Luck of Eden Hall'

Puck and the pixies belong to the same class of beings. Of the ell-folks of Scandinavia, the male is old and ill-favored, but the evil element in the ell-woman or ell-maid consists in her beauty, which enables her to be very dangerous to foolish young gentlemen, whom she waylays either by her own proper charms, or by personating the objects of their affections.

In Ireland, and in the border country of Scotland, the fairy superstition has been the theme of innumerable poetic legends and mystic traditions. T. Crofton Croker, in the *Fairy Legends and Traditions of the South of Ireland,* 3 vols. 1828, presents a full and amusing account of the Irish fairies, or elves, which he describes as 'a few inches high, airy, and almost transparent in body; so delicate in their form that a dew-drop, when they chance to dance on it, trembles indeed, but never breaks. Both sexes are of extraordinary beauty, and mortal beings cannot be compared with them.' They do not live alone, or in pairs, but always in large societies, and are governed by a queen. The same author adds: 'They are invisible to man, particularly in the day time, and as they can be present and hear what is said, the peasantry never speak of them but with caution and respect, terming them the good people, or friends. They have their dwellings in clefts of rocks, caves, and ancient tumuli. Every part within is decorated in the most splendid and magnificent manner; and the pleasing music which sometimes issues from thence in the night has delighted those who have been so fortunate as to hear it.' There are Irish fairies, however, of more special character. Among these are the Banshee, or female spirit who watches a particular family; the Cluricaune, an elf of evil disposition, who usually appears as a wrinkled old man, and has a knowledge of hidden treasure; and the Phooka, a spirit of diabolical disposition who sometimes appearing as an eagle or a black horse, hurries to destruction persons of whom he gets control. Of similar varieties are the Scottish elves: the Brownie, or domestic spirit nearly corresponding to the Banshee; the Kelpy, a kind of water-horse, being little different from the Phooka; and the Cluricaune being as regards figure somewhat analogous to the being sung by Leyden in his charming ballad, 'The Cout of Keilder' (*Minstrelsy of the Scottish Border*):

> 'Brown dwarf, that o'er the Muirland strays,
> Thy name to Keeldar tell!'
> 'The Brown Man of the muirs, who stays
> Beneath the heather-bell.'

According to Irish as well as Scottish fairy superstition, the elves, though in the main harmless, or at most tricky, have the bad reputation of stealing away young children from the cradle and substituting for them a changeling who bears a resemblance to the stolen infant, but is an ugly little creature, and never thrives. On this theft of a female infant, who is carried to Fairyland, but in the course of years returns to her parents, James Hogg founded his fine ballad of 'Kilmeny' (*Queen's Wake*). It need hardly be added, that in the progress of general intelligence, the fairy superstition has disappeared in Scotland as well as in the greater part of Ireland, and now is as little a matter of credence as is the belief in England of that useful drudging fiend, Robin Goodfellow. Besides being embalmed in imaginative literature, the fairy has a perpetual memorial in the small exquisitely shaped arrow-heads found so abundantly in northern countries, where they were long known as elf-arrows, or bolts with which the more malignant fairies sometimes slew or injured cattle and human beings; thus, when a poor man's cow or heifer was suddenly affected with some deadly and incomprehensible illness, it was said to be 'elf-shot:' see ELF-ARROWHEADS.

For the most comprehensive account in the English language of the various shapes assumed by this superstition, see *The Fairy Mythology*, by Thomas Keightley.

FAIRY RINGS: spots or circles sometimes seen in pastures, which are either more bare than the rest of the field, or more green and luxuriant. Frequently a bare ring appears, like a footpath, with green grass in the centre, and the circle which the ring forms, or of which it might form a part, is often some yards in diameter. These rings began to attract the attention of men of science in the latter part of the last century, and various hypotheses were suggested to account for them. Some imagined that they might be the effect of lightning. Dr. Withering appears to have been the first to ascribe them to the growth of fungi. Dr. Wollaston further investigated the subject, which has more recently been very fully investigated by Prof. Way; and it is now ascertained and universally admitted that fairy rings result from the centrifugal development of certain kinds of fungi, especially of *Agaricus oreades, A. gambosus, A. coccineus* and *A. personatus.* The Common Mushroom (*A. campestris*) shows a tendency to grow in the same manner. Probably the spot where the agaric has already grown is unfitted for its continued nourishment, and the *mycelium* (spawn) extends outward to new soil, the fungus unfitting the soil to which it extends for the immediate nourishment of grass, but enriching it afterwards by its own decay. The *mycelium* of many fungi has certainly a tendency to extend outward from a centre; and decayed fungi, containing not a little of the phosphate of potash, are a highly stimulant manure for grasses. Fairy rings of large size sometimes occupy the same situation for many years. The circle is almost always imperfect, some accidental circumstance having arrested the growth of the mycelium on one side.

FAIT ACCOMPLI, n. *fāt ak-kŏng-plē* [F.]: a fact already accomplished or completed; a scheme or idea already carried out.

FAITH, n. *fāth* [OF. *feid;* F. *foi*—from L. *fidem*, trust: It. *fede*, faith: comp. Gael. *feath*, calmness]: belief; trust; confidence; sincerity; belief in revealed religion; trust in God; a system of doctrines or tenets. Faithed, a. *fātht*, in *OE.*, invested with credibility; believed. Faith'ful, a. constant; of true fidelity; not fickle; true; exact. Faith'fully, ad. *-lĭ.* Faith'fulness, n. constancy; fidelity. Faith'less, a. *-lĕs*, not true in the performance of duty; false; not believing. Faith'lessly, ad. *-lĭ.* Faith'lessness, n. perfidy; unbelief; treachery. Faith breach, in *OE.*, breach of fidelity; perfidy. The faith, the Christian religion. The faithful, those firm in their adherence to the truths of Christianity; applied to their co-religionists by Rom. Catholics and by Mohammedans. Defender of the faith: see under Defend.—Syn. of 'faithful': trusty; honest; upright; sincere; veracious; loyal.

FAITH: term used in various senses in theology. It is taken sometimes to denote the mere assent of the understanding to a set of facts or of propositions set before it; it is more properly, or more scripturally, used to express the living reception by the heart of the 'truth as it is in Christ.' Some divines have enumerated no fewer than four kinds of faith: 1. The faith of miracles, or that immediate persuasion of the Almighty presence and power of their Master, which enabled the early Christians to work miracles—a persuasion, apparently, which might exist and issue in astonishing results without being associated with moral excellence: 'Though I have all faith,' says the Apostle Paul, 'so that I could remove mountains, and have not charity, I am nothing.' 2. Historical faith, or the assent of the mere intellect to truth, the evidence of which is irresistible, such as we have described above. 3. Partial or temporary faith, such as our Lord implies in his exposition of the parable of the Sower, and as appeared to animate those who, after having followed after Christ, turned back and walked no more with him. 4. Saving faith, or the persuasion of Christian truth wrought in the heart of the Holy Spirit—the chief Scriptural sense of the term.

These distinctions are theological refinements; the proper and characteristic meaning of the term in Scripture has little to do with any of them except the last. 'Faith,' says the writer of the Epistle to the Hebrews, 'is assurance of things hoped for, a conviction of things not seen.' It is a vision, a quality, or capacity of soul for action,—manifesting itself in the soul as a 'grace' or free gift of God—whereby spiritual truth is apprehended, and spiritual life engendered. The distant is brought near by it, and substantially appropriated; the unseen is felt to be a reality. Faith is the movement by which the soul passes beyond the present and the visible to the eternal and the invisible. Still more characteristically, perhaps, faith is the living affection which binds the Christian to Christ *as a personal Savior*. 'What shall I do to be saved?' asked the Philippian jailor of Paul. 'Believe on the Lord Jesus Christ,' was the reply, 'and thou shalt be saved.' It is Christ or God—a living person—rather than any mere truth or system of truths which is represented as the proper object of Christian faith. 'Believe in God, believe also in me.' 'We believe on him that raised Jesus our Lord from the dead.' 'Abraham believed God, and it was reckoned unto him for righteousness.' 'Come unto *me* all ye that labor and are heavy laden, and I will give you rest.'

Faith, therefore, in this its highest view, is nothing but supreme trust in God and His Christ. This is the faith which 'worketh by love,' and 'overcometh the world'—the faith of which the Apostles Paul and John alike speak. The faith mentioned by the Apostle James in apparent conflict with works is different; it seems to have been a mere religious distinction as between parties of Christians—'Thou hast faith, and I have works.' One party put forth faith as their religious badge—another works. The spiritual or true meaning of either the faith or the works was little regarded. The Scriptures teach always that a faith that does not issue into works and control the life, is not really faith.

Faith, in the distinctively Christian sense, can exist only by the operation of God's Holy Spirit. 'For by grace have ye been saved, through faith; and that not of yourselves: it is the gift of God.' Evangelical divines greatly insist on the necessity of this operation of the Spirit of God, yet in no wise thereby excluding the active co-operation of man, but rather as indicating the deepest ground of the man's action in believing. The Pelagian and Antinomian extremes respectively throw out—the former the divine; the latter the human element. The Scriptural teaching combines the two. For some principal theological controversies connected with faith, and not above mentioned, see JUSTIFICATION.—For the Analogy of Faith, see ANALOGY.

FAITH CURE: practice involving a professed belief that the bodily maladies of Christians are to be healed by the exercise of divine power, in answer to believing prayer, and without medical or surgical aid They who avow this belief say that the atonement of Christ has provided salvation for the body as well as the soul, and secures the possibility of deliverance in this life both from the inward power of sin and from sickness, provided that Christians comply with all the divine conditions. In support of their doctrine, appealing to the Scriptures, they say: that in Old Testament times from the patriarchs to the prophets, exemption and deliverance from physical disorders were sought, promised, and obtained through the direct agency of God; that the Savior, from the very beginning of his ministry, healed all kinds of bodily and mental diseases and infirmities, in order to fulfil the prophet's declaration, 'Himself took our infirmities and bare our sicknesses;' that, after his ascension, the apostles continued the work, exercising and imparting gifts of healing wherever they went; and that almost at the close of the New Testament the general direction is given, 'Is any among you sick, let him call for the elders of the church, and let them pray over him, anointing him with oil in the name of the Lord; and the prayer of faith shall save him that is sick, and the Lord shall raise him up.' In proof that, in fact, at the present day, complicated and violent diseases are cured in answer to prayer without the aid of medicine or physician, many cases are persistently published, some of which are—a withered hand, paralyzed limbs, and shattered nerves restored; malignant cancers and tumors cured; curvatures of the spine made straight; and diseases of the heart removed.—Those who do not accept this doctrine as accordant either with Scripture or with fact, say that equally remarkable cures are alleged to have been wrought at Lourdes, France, in answer to prayers offered to the Virgin Mary accompanied only with the use of unmedicinal spring water. Among these cases are—a half destroyed eye, a paralyzed hand, and drawn-up limbs restored; a running ulcer, and a body full of sores healed. The advocates of F. C. believe in the efficacy of prayer offered to God in the name of Christ. But they do not believe, probably few of them could be driven to allow, that the power of God is exerted in answer to prayer to the Virgin. If therefore the alleged cures have been wrought at her shrine they must, although inexplicable, be attributed to natural causes. Why then may not those alleged on the faith cure side also be? One advocate of F. C., however, seems ready to accept even the Lourdes cures as 'divine healing,' saying, 'If *faith in God* is exercised there, healing comes of course.' The adherents to this theory also assert that their number is rapidly increasing; that Dr. Cullis, in Boston, has crowds of sick people around him two hours daily five days in every week; that in Connecticut, a woman, having the gift of healing, is sought after continually; that there are 30 faith 'Homes' in America, and many in Europe, some of them, commodious institutions, as that at Bad Boll, near Stuttgardt, which is crowded with guests seeking the healing power of God; that, in 1885 an international council on this subject was held in London, composed of delegates from all parts of the world; and that during the last three years at conventions in New York, Philadelphia, Baltimore, Pittsburgh, and other American cities, 'Divine Healing' has been earnestly discussed.—The general Christian view of F.C. is probably the following: While it is not to be denied that certain cases of disease may be healed by the prayer of faith, it must yet seem vain to expect to bind God's wisdom and power to do man's will in such cases generally. The prayer of faith is necessarily a prayer of submission to God's will, and has no healing force or other force aside from such submissiveness. Moreover true faith, so far from calling us to dispense with all known remedial means, calls us to ask God's blessing on the diligent use of them: thus, the 'anointing with oil' (the common oriental remedy) is to be 'in the Name of the Lord.'

FAITH-ENROLLE, n.: in *law*, a deed enrolled as a bargain and sale of freeholds.

FAITHFULL, *fāth'fûl*, EMILY: reformer: b. Headley rectory, Surrey, Eng., 1835–1895, June 3; dau. of Rev. Ferdinand F., of the Established Church. She was educated in a Kensington school, and after her 20th year passed some time in the enjoyment of the social life in London, till, becoming interested in the condition of women, she applied herself to extending their sphere of labor. Her first efforts culminated in a large printing establishment, in which women were employed as compositors. In 1860, Queen Victoria, who had watched her labors with interest, gave her approval to the enterprise; and when presented with the *Victoria Regia*, an elegant specimen of workmanship wholly produced in the establishment, she allowed the concern to be styled the 'Victoria Press,' and appointed Miss F. printer and publisher in ordinary to her majesty. In 1863, May, Miss F. started *The Victoria Magazine*, monthly, in which she earnestly set forth her views and the claims of women to remunerative employment. She published a social novel *Change before Change*, 1868, and soon afterward made her appearance as a public lecturer in advocacy of her all-engrossing ideas. She published *Three Visits to America* (London 1884), and in 1888 conducted a large publishing establishment, with book-bindery, salesroom, and stationery business combined.

FAITHORNE, *fā'thorn*, William: eminent English engraver b. London, in the early part of the 17th c.; d. 1691, May. He was a pupil of Mr. (afterward Sir Robert) Peake, printer and printseller. On the outbreak of the civil war, he followed his master, who had taken up arms for King Charles. Both were taken prisoners at Basing-House. F was sent to London, and imprisoned in Aldersgate, but after some time was released, and went to France, where he increased his proficiency in the art of engraving, and returning to England about 1650, began business as a printseller near Temple Bar. He also engraved steadily up the booksellers at the same time. About 1680, he gave for his shop, but still prosecuted his art, besides executing portraits in crayon, and painting in miniature. F.'s engravings are mostly portraits. Walpole has given a list of them, including portraits of 'Thomas Hobbes,' ætat 76; 'Henrietta Maria;' 'Cromwell;' 'Prince Rupert;' 'Sir Thomas Fairfax;' and 'John Milton,' ætat 62. At first F. imitated the Dutch and Flemish manner of engraving; but his residence in France appears to have modified his earlier style. F. was an author also, having published 1662 a treatise on engraving, dedicated to his old master, and entitled *The Art of Graveing and Etching, wherein is expressed the true Way of Graveing in Copper. Also the Manner and Method of that famous Callot and M. Borse in their several Ways of Etching.*

FAITOUR, n. *fā'tŭr* [OF. *faiteor*, a maker or constructor—from *faire*, to make—from L. *făcĕrĕ*, to do, to make]: in *OE.*, one who makes for an ill purpose; a rascal; a traitor; a hypocrite; a scoundrel; a miscreant.

FAIX [a corruption of *faith*]: in faith; verily.

FAKE, or Faik, n. *fāk* [Scot. *faik*, a fold, a plait]: the single coil of a rope or cable when the coils are laid on, or are close to, each other; or as in the case of slate-stones, whose leaves or layers rest upon each other, and can be easily separated; in *Scot.*, a miner's term for sandy *shales* which split up into layers: V. to coil loosely, so as to be ready for use, a line, a rope, or a cable; to fold or tuck up. Fak'ing imp. Faked, pp. *fākt*.

FAKE, n. *fāk* [Gael. *faigh*, to get, to acquire]: in *thieves' slang*, to acquire; to lay hold of; to steal. Fake'ment, n. a begging petition. Faker, n. *fā'kĕr*, one who steals anything; a pickpocket.

FAKIR, sometimes Faquir, n. *fă-kēr'* [Ar. a poor man]: member of an order of mendicants or penitents, chiefly in India and the neighboring countries. In Persia and Turkey, the word is used also for Moslem priests, hermits, or monks, and dervishes (see Dervish). The origin of Fakirism, an institution which reaches to the most remote antiquity, is lost in mythical darkness. The common account of the son of a mighty rajah, who, expelled from his home and country by the cruelty of his father, made a vow, half in revenge, half in contrition, henceforth to roam a beggar through the world, and to win proselytes to a life of poverty and self-mortification, as the one most befitting in man, and most pleasing to the Deity, cannot be called historical. The same yearning for rest, for peace, and pious contemplation, for escape from the noise and turbulence of the world, which has everywhere and always led still and pensive minds into seclusion, must naturally have been more powerful in a land which yielded almost of itself, and in abundance, all that was necessary for the sustenance of man—in a climate of flower and sunshine, where a hermit's calm retreat might easily rise before the weared eye in the hues of Paradise. But constant seclusion and ceaseless meditation there, as elsewhere, produced sad results. Inward piety is no longer enough; sanctity established through outward observances is the goal. Thus, abstinence becomes mortification and self-torture; mental repose, mystic self-absorption, or frenzied exaltation. This leaning of the Hindus to a life of asceticism was fostered by their primeval religion, which enjoins various exercises of penance and mortification on the three higher castes in general, but upon the Brahmins in particular. These, having passed through different stages of regeneration, end by becoming Sanyassis ('who have left everything') and are dead to the law. The world and its usages have no more any claim upon them; even religious ceremonies are no longer necessary to the 'United with God.' They go naked, or in filthy rags, receive the meanest food only, and that without either demand or thanks. Their ethical code consists in the observance of truth, chastity, internal purity, constant repentance, and contemplation of Deity. After these models Fakirism seems chiefly to have been framed, and its adherents were not only pious men, but occasionally were reputed saints, workers of miracles, and healers of all ills, especially epilepsy and sterility. The halo which from the first surrounded Fakirism, and the ready homage offered by the people, attracted to its ranks, at a very early date, many whose motives were impure, and who, under a garb of humility and mendicity, collected fabulous treasures. Strabo distinguishes these vagabonds from the more honest members of their class, and if we may trust the travellers of our own day, the more respectable element has now altogether disappeared. Their number is variously stated. In the time of Tavernier's visit, there were more than 1,200,000 Hindu, and 800,000 Mohammedan fakirs in the E. Indies, and their present number is said to exceed 3,000,000. Papi describes the Mohammedans as guilty of the greater follies. At times, especially in their return from distant pilgrimages, they are even dangerous, as the killing of an unbeliever is supposed an infallible introduction to the glories of paradise. They live either separately as hermits or solitary mendicants, or unite in large gangs, carrying arms and a banner, beating drums, and sounding horns as they approach a town or village. Their appearance is disgusting in the extreme; they go naked, besmeared with the dung of the holy animal, the cow. Some bedeck themselves with the skins of serpents, some with human bones; others array themselves in the garb of women. Their fearful shrieks, and the hideous rollings of their eyes, add to the disgust of their appearance. Imitating madmen, they generally end by becoming madmen. The height to which self-torture is frequently carried by these wretched fanatics and of which we meet with signs even so far back as the Ramayana, in which a penitent is described as perpetually sitting with upraised arms between four fires, the sun forming the fifth, is so appalling that human nature shrinks from the mere description. Some pass their whole lives in iron cages, laden with heavy chains; some clench their fists till their nails grow through the hand; others hold aloft both their arms till they become like withered branches; while others, again, tie their hands and feet together, and roll head over heels for thousands of miles. These antics of a horrible religion are not confined to men, but youths and even children of tender age are occasionally initiated therein.

FALABA, *fâ-lâ'bâ:* fortified town of Senegambia, cap. of Sulimana, w. Africa; on the Fala river; 190 m. n.w of Freetown, 215 m. n. e. of Sierra Leone. The fortifications consist of a high stockade, with a moat 20 ft. wide and deep, which surround the town. The houses are built of clay and arranged in clusters round court yards. F. was founded by the Sulimas, a tribe of the Mohammedan Foulas, who revolted and became masters of the neighboring villages and country. It was visited by Maj. Laing 1825, and Winwood Reade 1869, both of whom wrote descriptions of the town and its people.

FALAISE, *fâ-lāz':* town of France, dept. of Calvados, on a lofty platform bordering on a precipice, or *falaise*, whence its name. It is on the Anté, a feeder of the Dive, 22 m. s.s.e. of Caen. It has three suburbs, one Guibray, a mile to the e. rivals the town itself in size and population. The buildings of interest are the ecclesiastical edifices, the hospital, the public library, and, more than all, the old and ruined castle, once the seat of the dukes of Normandy, and the birthplace of William the Conqueror. In the castle, the chamber in which the Conqueror was born is still shown, as well as a tower called 'Talbot's' Tower, supposed to have been built by Talbot when lord warden of the district, after the capture of F. by Henry V. of England. F. has manufactures of cottons, hosiery, and bobbinet. At Guibray, an important annual fair is held Aug 10–25, at which great numbers of horses and cattle are sold. Pop. (1881) 8,201; (1891) 8,313.

FALASHAS, *fâ-lâ'shas:* body of Jews occupying the high regions of Samen and the plains along Lake Tzana, Abyssinia. Their origin is uncertain, though many authorities believe they are not natives of the locality, from their name, which means exiles or wanderers. According to their own traditions, however, they are descendants of the tribe of Levi and settled in Abyssinia in the days of King Solomon. They inhabit principally the provinces of Samen, Wogara, Armatshoho, Walkait, Tchelga, Dembea, Tenkel, Dagusa, Alafa, Kunsula, Aschafer, Agarv-Meder, and Quara; observe the Jewish modes of life; and differ from other Jews in personal appearance and the belief that commercial transactions are virtually forbidden in the Mosaic law. They have no knowledge of either the Babylonian or Jerusalem Talmud, do not use the *tephilin* nor observe the feast of Purim nor the dedication of the temple, and are ignorant of Hebrew; but possess in Ethiopic a variety of religious rules and instructions such as the canonical and apocryphal books of the Old Test., a vol. of extracts from the Pentateuch with God's comments to Moses on Mount Sinai, laws governing the Sabbath, lives of the prophets, and a translation of the writings of Josephus. They observe with extreme rigor the Sabbath, which has been deified and as the goddess *Sanbat* receives both adoration and sacrifice. They are so afraid of giving offense that they will not dress themselves on that day. A limited superstition prevails among them, the *Ardit*, a book of secrets revealed to 12 saints, being used as a charm against disease. They are handsomely formed, of medium height, with oval faces and long curly hair. While religiously averse to engaging in commerce, they are exceedingly industrious, cultivate the soil, manufacture pottery, iron ware, and cloth, and have great skill as architects and masons. They are exempt from military duty on account of their scruples against shedding human blood, though during the war between Great Britain and Abyssinia 1868, many of them distinguished themselves as warriors under King Theodore. The F. were independent and governed by their own princes till the beginning of the 19th c., when they were conquered by the Amharas, and have since been under the rule of the princes of Tigré. They number abt. 250,000.

FALCADE, n. *făl-kād'* [F.—from L. *falx*, a sickle, a hook]: a falling sharply on the haunches, as a horse.

FALCARIOUS, a. *făl-kār'ĭ-ŭs* [L. *falcarius*—from *falx*, a scythe, a sickle]: in *bot.*, plane and curved with the edges parallel.

FALCATE, a. *făl'kāt*, or FAL'CATED [L. *falcātus*, scythe-shaped—from *falx*, a reaping-hook: It. *falcato*]: in *bot.*, bent or shaped like a reaping-hook; crescent-shaped. FALCA'TION, n. *-kā'shŭn*, the state of being crooked as a sickle; a bending in the form of a sickle. FALCIFORM, a. *făl'sĭ-fawrm* [L. *forma*, shape]: shaped like a reaping-hook.

FALCHION, n. *fawl'shŭn* [It. *falcione*, a scimitar—from mid. L. *falcĭōnem*, a sickle-shaped sword—from L. *falcem*, a reaping hook: F. *fauchon*, a small scythe: comp. Gael. *fal*, a scythe, a spade]: a short crooked sword; a scimeter: see SWORD.

FALCIDIAN LAW, *făl-sĭd'ĭ-an:* statute proposed by the Roman tribune Falcidius, and enacted during the reign of

Augustus in the year of Rome 714. It gave power to fathers of families to bequeath three-fourths of their property by will as they pleased, but prohibited their giving away the other fourth, termed the Falcidian portion, which was to descend to the heir. The same principle prevailed in England in early times, and is still observed in several states of the American Union. At common law no such testamentary restrictions exist.

FALCK LAWS (against Papal claims): see GERMANY.

FALCON, n. *faw'kn* [F. *faucon;* OF. *faulcon*—from mid. L. *falcōnem;* It. *falcone,* a falcon—from L. *falx,* a reaping hook]: a hawk trained for hunting—so named from its hooked beak. FALCONER, n. *faw'kn-ėr,* one who trains or sports with falcons. FALCONRY, n. *faw'kn-rĭ,* the art of training or hunting with hawks. *Falcon* in the Linnæan zoology, genus of birds, including all the diurnal birds of prey, now known as the family of *Falconidæ* (q.v.); but in its present use as a generic name, limited to nearer accordance with its popular use, as a designation of those species which, in the language of falconry, were styled *noble birds of prey.* The true falcons are characterized by a bill curved from the base, the upper mandible hooked at the point, and the cutting edge of the upper mandible furnished with a strong projecting notch, or *tooth.* The claws are sharp, curved, and strong; and in accordance with all this powerful armature, the whole frame is very robust and muscular. The legs are rather short, and have great power in striking or seizing prey. The keel of the sternum (breastbone) is very large, and adapted for the attachment of powerful muscles; the furcula and coracoid bones (see BIRDS) also are very strong, to afford a sufficient resisting base for very powerful action of the wings. The wings are long and pointed, the first and third quill-feathers of equal length, the second rather the longest, the first and second quill-feathers emarginated near the tip. The true falcons are bolder in proportion to their size than any other Falconidæ —even eagles. Their acuteness of vision is wonderful; and they have very great powers of flight. A F. is known to have traversed the distance between Fontainbleau and Malta, not less than 1,350 m. in 24 hours. The speed attained by a F. in pursuit of its prey has been calculated to be at the rate of 150 m. an hour. They soar to a prodigious height in the air, always endeavoring to outsoar any bird of which they may be in pursuit, and to swoop down upon it from above; though it is far more difficult for them to rise vertically in a calm atmosphere than for birds of short and rounded wing, and they either rise obliquely—often also making their onward flight in a series of arcs—or avail themselves of the wind, and by flying against it, are borne aloft as a boy's kite is. The species are numerous; some are of very wide geographic distribution, while others are peculiar to certain countries or climates. Among the species are the GYRFALCON (q.v.), or Jerfalcon (*F. Gyrfalco*); the Iceland Falcon (*F. Islandicus*); the Greenland Falcon (*F. Grenlandicus*); the PEREGRINE F. (q. v.) (*F. peregrinus*), of which the female is *par excellence* the F. of Falconers (see FALCONRY), and the male is the Tercel, Tiercel, or Tercelet; the HOBBY (q.v.), (*F. subbuteo*); the Red-footed F., or Red-legged F. (*F. rufipes*), a small species, much resembling the Hobby; the MERLIN (q.v.), (*F. æsalon*); and the KESTREL (q.v.), or Windhover (*F. tinnunculus*). For the species chiefly used in falconry, see FALCONRY.

The first 3 mentioned, and the Labrador F. (all native in N. Amer.), are thought to be possible varieties of one species. These (all very large, with tarsus narrowly bare behind), the Peregrine, and the Lanner or Prairie F. (*F. mexicanus*), grayish brown above (a w. species), and the Pigeon and Sparrow Hawks, represent the genus *Falco* in N. America.

FALCON, *fâl-kōn'* (formerly CORO): irregular-shaped province of Venezuela, S. Amer.; bounded n. and e. by the Caribbean Sea, s. by the provinces of Carabobo and Barquesimeto, w. by the province of Maracaybo; 11,250 sq. m. Its surface is diversified, though chiefly a low plain; the Sierra de Coro attains an elevation of 4,250 ft. in the interior; and while the soil in general is neither fertile nor adequately watered, the highest parts of the mountains are covered with fine forests. Products: cattle, coffee, cacao, cotton. Cap. Coro. Pop. (1873) 99,920; (1891) 224,566.

CORO, or SANTA AÑA DE CORO, town, cap. of the province of Falcon, is near the Caribbean Sea and the isthmus connecting Paraguana with the mainland. Pop. about 9,000.

FALCONE, *fâl-kō'nā*, ANCILLO: 1600–63; b. Naples: Italian battle-painter. A fellow-student of Salvator Rosa's at Spagnoletto's studio, he himself subsequently became the founder of an academy of much resort. In accordance with his turbulent impulsive nature, he flung himself into the political struggles of the times, and during Masaniello's outbreak, organized his numerous scholars and dependants into a secret band, which inflicted deadly retaliation on the Spaniards. On the suppression of the insurrection, F. fled to France, but returned to Naples, where he died. His works are few and costly; they are prized for extreme fidelity to nature, as much as for harmony and brilliancy of color, and variety of expression.

FALCONER, *fawk'nėr*, or *faw'kėn-ėr*, WILLIAM: 1732–69 b. Edinburgh; one of a family of whom all, excepting himself, were deaf-mutes. He went early to sea, serving his apprenticeship on board a merchantman; and before he was 18 years of age he was second mate, in a vessel in the Levant trade, which was shipwrecked off Cape Colonna, himself and two others being the only ones of the crew saved. He published *The Shipwreck* 1762, and during the next year entered the navy as midshipman in the *Royal George*. When peace came, he resided in London, where he wrote a satire on Wilkes, and compiled a *Nautical Dictionary*. He sailed 1769, Sep., as purser in the *Aurora* frigate; reached the Cape of Good Hope in Dec.; and perished with his companions—the *Aurora* having gone down —in the Mozambique Channel. F. wrote several poems, but *The Shipwreck* is the one on which his fame rests. It abounds in nautical language, and has the rare merit of being interesting. It is not a great poem, but has always had readers and admirers. In the second ed., the author added the characters of Albert, Rodmond, Palemon, and Anna—characters bearing the same relation to actual sailors that Alexis and Chloe bear to actual shepherds and shepherdnesses—and to some extent destroyed that singleness of impression which was the chief merit of his work.

FALCONET, n. *făl'ko-nĕt* [F. *falconette,* dim. of OF. *falcon*]: in *zool.*, a little falcon; name applied to a genus of tiny falcons, belonging to the sub-family *Falconinæ,* peculiar to the region of India, none being seven inches in length.

FALCONET: name in the 15th and 16th c. for the smallest class of cannon. The ball weighed from 1 lb. to 3 lbs., and the gun from 5 cwt. to 15 cwt.

FALCONIDÆ, *făl-kŏn'ĭ-dē:* family of diurnal birds of prey (see ACCIPITRES), corresponding with the Linnæan genus *Falco,* and exhibiting those characters of muscular vigor, armature of beak and talons, and power of flight, found in their highest perfection in the true Falcons (q.v.), and in scarcely inferior degree in the Eagles (q.v.). The species are numerous; the British Museum alone contains specimens of almost 200 unquestionably distinct species; but very many supposed species have been named and described by ornithologists, which have been ascertained to owe their distinctive characters merely to age and sex. The female is generally larger than the male; and the plumage of the young different from that of the adult. There are, in the different groups, considerable diversities in the curvature and strength of the bill, which has the cutting edges of the mandibles either notched, festooned, or plain; the legs and toes also exhibit diversities as to length, strength, feathering, etc.; and in some groups, the wings are much

Head and Foot of Brazilian Eagle.

longer and more pointed, than in others. This is so particularly with the true falcons, as contrasted with eagles, hawks, buzzards, kites, harriers, etc., and, in the language of falconry, the former—having the second quill-feather longest, and the first nearly equal to it—are called *noble birds of prey* (see FALCONRY), being those usually domesticated and trained for the service of man; the latter—having the fourth quill-feather longest, and the first very short—are called *ignoble birds of prey,* even eagles receiving this designation. The F. are distributed over all parts of the world; and almost all kinds of vertebrate animals, except the largest quadrupeds, are the prey of some of them. Some also devour insects. Like the *Felidæ* among ravenous quadrupeds, the F. do not willingly feed on carrion, but generally seize and kill their prey. As in the *Felidæ,* also, there is a provision for the preservation of the claws from being blunted by unnecessary contact with the ground or with any hard substance, the F. contracting the toes so as to elevate their claws. The F. generally live in pairs.

The Amer. sub-families of F. are the *Circinæ,* harriers, face with an owl-like ruff—our species being the Marsh Hawk; *Milvinæ,* kites, bill weak, tail forked or else much shorter than the long, pointed wings—examples, Everglade Kite, Mississippi Kite (s. and n. in the great valley), Black-shouldered or White-tailed Kite and Swallow-tailed Kite (same range); *Accipitrinæ,* hawks, long tail and legs, bill high at base, strong, toothless—examples, Sharp-shinned Hawk, Cooper's or Chicken Hawk, and American Goshawk, sometimes called the Blue Hen Hawk and the young called Chicken Hawk; *Falconinæ,* falcons, both mandibles toothed, the end of the lower truncated—for examples, see FALCON; *Polyborinæ,* caracaras, terrestrial in habit, feeding much on carrion—one example, the Common Caracara of Florida to Lower California; *Buteoninæ,* buzzards and eagles, cutting edge of bill only lobed or festooned—embracing the Harris's, the White-tailed, the Cooper's, the Harlan's (Black Warrior), five Red-tailed, two Red-shouldered or Winter (sometimes called Chicken Hawk), the Band-tailed, the Swainson's or Common, the Broad-winged, Rough-legged, Fuliginous, Ferruginous, Star, Gray Star, two Anthracite, the Clawed, and Gruber's Buzzards, and four Eagles; here mentioning only American species. The Fish Hawk or Osprey, probably the one and only cosmopolitan species, stands for a separate family, *Pandionidæ;* it visibly differs in close, firm plumage and immensely strong feet, both adapted to its fishing habit.

The Lammergeir (q.v.) connects this family with the Vultures; the Secretary (q.v.), while in many respects agreeing with the F., is peculiar in some of its characters. The American vultures are very different from those mentioned, and are made a sub-order, *Cathartides;* they resemble turkeys in appearance, e.g., the turkey-buzzard; the only resemblance to the old-world vultures is in carrion-feeding; the confusion of names is unfortunate. True vultures may be regarded as a sub-family of F.

FALCONRY, *faw'kn-rĭ:* the term applied to the art of training certain of the falcon tribes to the pursuit and capture, on the wing, of birds such as the heron, partridge, lark, rood, magpie, wild-duck, pigeon, etc. In ancient times, this sport was called HAWKING, a term still preserved in many places, and, perhaps, more strictly correct. In present usage, *Falconry* is the term applied to the sport and all that pertains to it; *Hawking* to its actual practice in the field. F. is of very ancient origin, and has been traced back, as an Eastern sport, to a period anterior to the Christian era. In Britain it seems to have been followed before the time of the Heptarchy; and in the celebrated Bayeux tapestry, Harold is figured with a hawk upon his hand. It seems, however, to have been practiced in Eastern countries, and in central Europe, long before it became established in Great Britain; and to such a height did the sport reach in Germany, that nobles, and even kings, seem to have devoted to it the greater part of their time. As an instance of this, Emperor Frederick II. of Germany was a passionate admirer of the sport, and is said to have written a treatise on F., published by J. G. Schneider, 1788 (2 vols. Leip.). In England, after the Norman Conquest, F. seems to have rapidly advanced, being much indulged in by kings, nobles, and ladies; and in those days the rank of the individual was indicated by the particular species of hawk carried on his wrist. Thus, an earl carried a Peregrine Falcon. In the 17th c., the sport declined; in the 18th c. it partially revived, but again fell off about 1725, when the art of shooting birds on the wing came into fashion. In the present day, an attempt is being made in several quarters in England, with some success, to restore this sport. In India, Persia, and other Eastern countries, F. is still eagerly practiced, the methods there followed being nearly similar to those of Great Britain.

In F., two distinct kind of hawks are used—the long-winged or true falcons, and short-winged. The first (noble birds of prey) are represented by the Gyrfalcon and Peregrine; the second by the Goshawk and Sparrow-hawk; and though for certain purposes the male is superior, as a rule the *females* of each species are much more highly esteemed for sporting purposes, from their being larger and more powerful. ‘Long-winged’ hawks may also, as a rule, be distinguished from the ‘short-winged,’ by their having a ‘tooth’ or notch on the upper mandible; from the second feather of the wing being either longer, or as long, as the third; and from their impetuous ‘stoop’ at their prey.

The Gyrfalcon (q.v.) is the largest species, but from its extreme rarity in the British Islands, is seldom used. The Peregrine Falcon is the bird in greatest favor with falconers, and if taken from the nest, as is usually the case, and carefully trained, affords better sport than any other British species. The remarks which follow refer to the sport as practiced with this bird.—No hawk is fit for sporting purposes until it has undergone a careful process of training. The young hawk is more easily trained than one grown, caught in a wild state; but in either case, a number of operations require to be gone through before the sportsman ventures to take his falcon into the field. Taken from her nest on some high and dangerous cliff when nearly fledged, the *eyess*, or young falcon (with her companion-fledglings, usually two in number), is carefully conveyed to the falconer's home; there she is kept in an open shed in a nest of straw, and fed several times a day on fresh beef, with an occasional change to birds or rabbits At this somewhat critical period, she should never be handled, except to put on the *jesses* and *bells* (see fig. 1), which afterward become permanent fixtures. Her powers of flight, too, being as yet very limited, she depends upon her master for regular supplies of food, and soon learns to come for her meals at his call. Her meat is usually fixed to an apparatus termed the *lure* (see fig. 2), and thus the hawk is early accustomed to that important instrument, the further uses of which are explained below. By degrees her powers of flight are strengthened, and she is permitted to fly at large (returning to the lure at her master's will to be fed, or in hawking language, to remain *at hack*) for several weeks, during which time her meals are gradually reduced to one a day. While at hack, she sometimes becomes wild, wanders far from home, and kills game for herself; and when this is the case, she is usually caught by enticing her to a bow-net, close to which a pigeon or some meat is fastened to the ground. After being 'taken up' from hack, she is kept at the *block* (see fig. 3)—the stand upon which she sits—for a few days before her regular training begins. At this time, also, hawks require a bath twice or thrice a week.

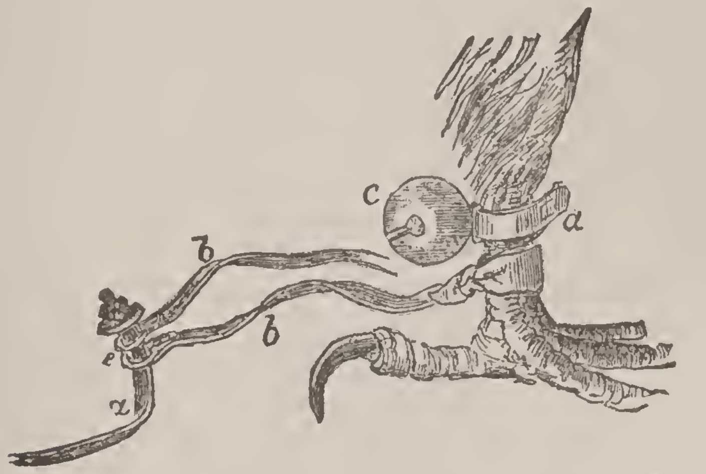


Fig. 1.—Leg and Foot of Hawk, showing the method of attaching the Bells and Jesses.

a, the end of leash; *b*, *b*, the jesses; *c*, the bell; *d*, the bewit; *e*, the varvels of silver, with owner's name and address engraved.

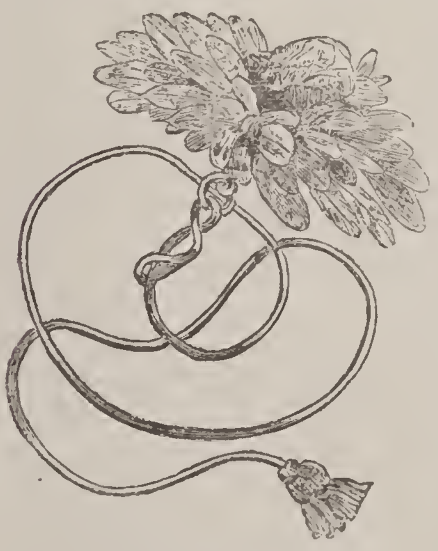


Fig. 2.—The Lure.

The first of the principal operations in training is *hooding*, an operation which, if successfully performed by the trainer during his earlier efforts, prepares the way for overcoming many subsequent difficulties. It demands the greatest patience and the tenderest manipulation. The hood is a cap of leather (see fig. 3), made to fit the head of the falcon in such a manner as totally to obscure the light, a simple aperture only being left, through which the beak protrudes, and a slit behind, through which are passed the braces or ties that secure the hood to the head. By shutting out the light, the hood is serviceable in tending to make the hawk quiet and tractable, but to accustom the falcon to submit to its use requires much time and great management. When, after great perseverance, this is achieved, the hawk is said to be '*made to the hood,*' during which process she also learns to sit balanced upon the fist. Besides tending to induce docility by hiding the light, the hood is of further service in shutting out from view any

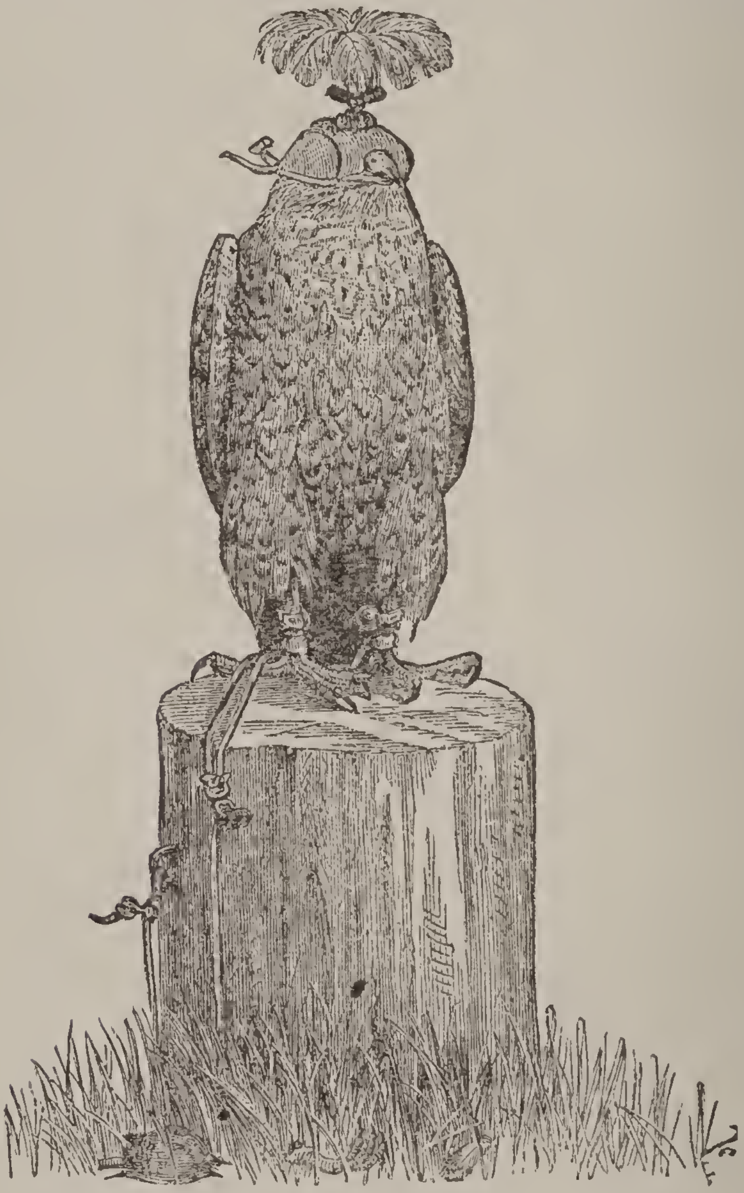


Fig. 3—Hooded Peregrine Falcon on its block:

One end of the leash is attached to the Jesses, the other to a ring driven into the side of the block; and thus the hawk is prevented from escaping.

object which might cause the hawk to flutter or *bait* off the fist or *cadge* on its way to and from the field, etc. Hence the hawk is carried always hooded—the short-winged only being exempt. To the falcon's legs are attached two small hollow globes of thin metal, called *bells;* these are fixed to their place by leather straps called *bewits;* and both, together with the jesses, become permanent fixtures even during the bird's flights. *Jesses* are two leathern traps, five or six inches in length, attached to each leg immediately below the bells; the jesses, again, are themselves attached to another leathern strap, called the *leash,* about four times the thickness of a boot-lace (see fig. 1), by two rings or *varvels ;* and the bird being thus caparisoned, the falconer winds the leash through his fingers, and so prevents the falcon's escape while on his wrist. Instead of varvels, some falconers follow the Dutch plan of using a swivel; the former method, however, is now considered best. A long cord, called the *creance,* is further attached to the leash, and is used for the purpose of giving the bird greater freedom during her training than that afforded by the leash alone.

The *lure* is a bunch of feathers attached to a cord and tassel, and in the centre of the feathers is usually a piece of spliced wood, to which a piece of meat may be attached. By accustoming the hawk to feed off the lure, or to come to it at a certain call or whistle to be fed when on the wing, the lure becomes an important adjunct to the falconer's apparatus, as by it he is enabled to entice his bird back after an unsuccessful chase. On such occasions, the falconer reclaims his bird by swinging the baited lure round and round his head, accompanying the action by some well-known call. Four wings tied together make a good lure. The *tabur stycke* and *drawer* were formerly used for the same purpose as the lure, but were made in the form of a stick.

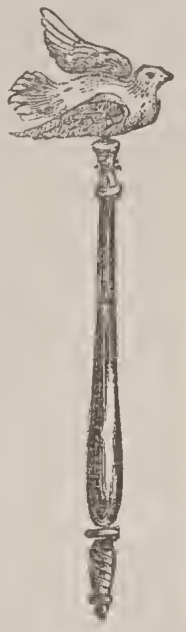


Fig. 4.—Tabur Stycke.

In Europe, hawks are carried on the left wrist (in the East they sit on the right); and to protect the falconer's hand from being injured by the bird's claws, a glove of stout buckskin leather is used. And here it may be remarked, that the claws and beak of wild caught or *haggard* falcons, are usually pared or *coped.* If the bird to be trained, instead of being a nestling, happens to be a wild one, the difficulties of training are immeasurably increased, and can be overcome only by days and nights of unwearying exertion. If it proves unusually restless and difficult to tame, it is kept on low diet, is prevented from sleeping for several days and nights, and has cold water poured upon it by means of a sponge, etc. By these and other means, the falcon gradually loses much of its restiveness, and submits to the processes of training.

For training the *eyess,* or young falcon, to the lure, as preparatory to entering at game, Sir John Sebright says

'Take the hawk out while very hungry, and let an assistant swing the lure round his head steadily, and at full length of the cord; upon this the falconer casts off his hawk with the usual whistle or halloo, still holding the *creance*, and the assistant suffers the lure to fall to the ground, for fear of injury to the hawk, by striking it in the air with the two strings attached. When this lesson is perfect, the assistant, instead of suffering the lure to fall, withdraws it, and disappoints the hawk, which flies by him, and then returns, when he may be suffered to strike the lure and feed upon it. In process of time, the creance may be removed, and the hawk enticed to the lure from a considerable distance, and may then strike it in the air (if the lure is a light one), while swinging round the head of the assistant. After a still greater time, the hawk becomes so perfect that she will circle round the head of the falconer, waiting for the lure to be thrown, and is then said to '*wait on*' perfectly. When the hawk is feeding on the lure, the falconer should encourage her, and suffer her to finish without alarm, by which she will be shown that she may do so without fear, and will readily suffer herself to be taken after flying. She should also be accustomed to horses, men, and dogs.'

Having 'made the hawk' to *the fist*, *the hood*, and *the lure*, she is next 'entered' at her game (the *quarry*). This is done by tying a long cord or *creance* to the varvels of the jesses, and flying the hawk from the hand at a bird thrown out to it, also restrained by a cord. The hawk is next flown several times without a creance at birds *shortened in their flight*, after which it is ready to be entered at wild quarry. In case of failure, however, a live bird, similar to that at which she is flown, should be carried to the field, and thrown out to her in a creance by way of encouragement.

The heron is, and always has been, a favorite object of pursuit in British F., the period of the year best adapted for the sport being the breeding season. Having previously ascertained the feeding-place of that bird, the hawking party goes to the spot, usually toward evening, if possible in a direction *down-wind* from the heronry, so as to intercept the bird in its *up-wind* flight homeward. When a heron is seen to pass, a couple (a cast) of hawks are unhooded and 'cast off,' and the chase commences. The heron, seeing the falcons approach, disgorges its food, to lighten itself, and immediately ascends in the air; the hawks, eager in pursuit, and quicker of wing, speedily make upon it, and strive to gain a greater elevation by a series of beautiful gyrations. When one of the hawks succeeds in rising above the heron, it *stoops*, that is, descends swiftly, and in a direct line, upon the game, aiming a stroke with its outstretched legs and talons at its body; this the heron almost always succeeds at first in eluding, by a rapid and sudden movement aside. The second hawk, which also by this time has soared, then stoops, while the first is regaining its former altitude; and so on for many successive times, till one hawk at length clutches the heron or *binds*, upon which her companion joins her, and the three, buoyant by the motion of their wings, descend gently to the earth. The falconer's imperative duty is now to be up or near the spot where the three birds are descending, to divert the attention of the hawks before they reach the ground, and entice them from the quarry to him, by means of live pigeons as lures. This is very necessary, as the heron is extremely dangerous, and has been frequently known to injure the hawks with its sharp beak when on the ground, though it is almost harmless in the air. When the heron's wounds have been dressed—for this bird is rarely killed in such encounters—a ring with the captor's name is usually affixed to its leg, after which it is set at liberty, and so becomes available for future sport. The falconer's usual cry of encouragement to his hawks upon the springing of the quarry is 'Hooha-ha-ha-ha!' His cry when the quarry is killed, is 'Whoop!' A falcon takes its prey either by tearing or *raking* it with the *hind* claw of each foot at the instant of passing, or by clutching the victim with its talons, and when she thus succeeds in binding to her quarry, she slowly descends with it to the ground. The supposition that the hawk strikes its quarry with the beak or breastbone in its swoop, is a mistake.

Besides the Peregrine Falcon, the Merlin is trained for F., and is extremely bold. This bird, however, is flown at small game, chiefly larks. The Goshawk, though it does not soar and stoop; flies direct at its game: it is used chiefly for pheasants, rabbits, hares, etc., in an inclosed country. The Sparrow-hawk, from its extreme boldness, is a great favorite, but is flown at smaller birds only, such as blackbirds, thrushes, etc. The Hobby is seldom or never used.

The following are the principal terms in falconry. A falcon's legs, from the thigh to the foot, are termed *arms;* toes, *petty singles;* claws, *pounces;* wings, *sails;* trail, *train;* crop, *gorge;* lower stomach, *pannel;* feathers, hair, etc., ejected at the mouth, *the castings.* A young hawk from the nest is *an eyess* or *eyas;* one that can hop, but not fly well, *a brancher;* a nestling hawk reared at liberty is a *hack-hawk;* a young hawk able to take game, a *soar-hawk;* a mature wild hawk is a *haggard* or *blue-hawk;* young hawks taken in their migrations, are *passage-hawks,* or *red hawks*—the term *red* being applied merely as a title of distinction between the young hawk and the eyess or nestling, the colors of the two being in reality the same. The training of the passage-hawk and haggard is termed *reclaiming;* fluttering, is *baiting;* fighting with each other, *crabbing;* sleeping, *jouking.* The prey is termed the *quarry.* When the hawk strikes her quarry in the air and clings to it, she *binds;* when she flies off with it, she *carries;* when she plucks it, she *deplumes.* Dead game is *the pelt. Stooping* or *swooping* is the act of descending with closed wings from a height at prey. Direct flight, without soaring, is *raking off;* changing from one bird to another, *checking.* When game flies into a cover, it *puts in.* When the hawk is moulting her feathers, she is *mewing;* after her first moult, she is *intermewed;* with complete plumage, *summed:* when in good condition, she is *enseamed;* when out of condition, *seamed.* Mending the feathers artificially (an operation frequently performed when one has been accidentally broken) is termed *imping;* blunting bill and talons, *coping* When the falcon is obediently flying round in the air, she *waits on her master;* flying long-winged hawks from the wrist, is termed *flying out of the hood;* a couple of hawks is a *cast.* The *cadge* is a frame of wood with four legs. It is carried by means of straps, which pass over the bearers. (the cadgers') shoulders, and is used, when there are several casts of hawks, to be taken to the field. The *block* (see fig. 3) is a round piece of wood, such as would be made by sawing a foot of wood out of a felled larch-tree of 20 years' growth; and upon this the hawk sits when out of doors. Through the bottom of the block runs an iron spike, which being driven into the ground, secures the block to its place, and so prevents the hawk from dragging it away. Falcons are very pugnacious, and if not carefully kept separate, would soon kill each other. The *screen* or *perch* is a perch guarded by a falling piece of canvas, to support the hawks in case of their leaping down; upon this, the hawks are placed at night in an apartment called the *mews.*

The best works on the subject are those of Turberville and Latham, respectively, as old treatises; and that of Sir John Sebright, as comparatively modern. Of the more recent treatises, *Falconry in the British Isles,* by Salvin and Brodrick; and *Falconry, its Claims and Practice,* by Freeman and Salvin, are standard. See also Stonehenge's *British Rural Sports* (Lond., Warne & Co.).

The village of Falconswaerd, near Bois-le-Duc, in Holland, has for many years furnished falconers to almost all Europe. Sir John Sebright says: 'I have known many falconers in England, and in the service of different princes on the continent, but I never met with one of them who was not a native of Falconswaerd.'

FALCULA, n. *făl'kŭ-la* [L. dim. of *falx,* a sickle, a scythe]: in *zool.*, term applied to a claw, which is compressed, elongated, curved, and sharp-pointed.

FALDAGE, n. *fawld'ĭj* [Low L.—from *falda,* a fold]: in *feudal law,* privilege which anciently several lords reserved to themselves of setting up folds for sheep, in any fields within their manors. FALD-FEE, n. *-fē,* in *feudal law,* a composition or fee formerly paid by tenants for the privilege of faldage.

FALDERALS, n. plu. *făl'dėr-âls* [Sp. *faldilla,* a little fold or skirt; *falderilla,* a little lap]: the small pieces made to ornament a female's dress, especially when loose and in excess; gewgaws; idle fancies or conceits.

FALDSTOOL, n. *fawld'stôl* [OF. *faudesteuil*—from mid. L. *fauldistōlĭŭm* and *faldistōrĭŭm*—from O.H.G. *faldan,* to fold; *stual,* a stool: AS. *fald,* a fold, and *stool*]: the low desk at which the Litany is said in churches; the chair of a bishop within the rails of the altar. FALD'ISTORY, n. *-ĭs-tėr-ĭ,* a kind of stool on which the king may kneel at his coronation at the south side of the altar; a folding-chair.

FALEME, *fâ-lă'mā:* one of the most important tributaries of the Senegal (q.v.), into which it falls, lat. about 14° 40′ n., and long. 11° 48′ w. Its course has not been fully explored.

FALERII, *fâ-lĕ'rĭ-ī:* city of ancient Etruria, w. of the Tiber, n. of Mount Soracte. Its earliest historical appearance is B.C. 437, when, according to Livy, the inhabitants (called Falisci) joined with those of Veii in assisting the Fidenates against the Romans. The Falisci were among the most dangerous enemies of Rome, and were the last of the Etrurians who submitted to its power. Their city was at last destroyed by the Romans (B.C. 241), and they themselves were compelled to choose a new site a few miles off. Here a Roman colony was settled in the time of the triumvirs, whence the place took the name of *Colonia Junonia Faliscorum.* But this Roman F. does not appear to have ever acquired any importance, for the temple which anciently attracted so many pilgrims, stood on the site of the older town. During the middle ages, however, a new city sprang up on the ruins of the Etruscan F., which finally obtained the name of *Civita Castellana* (q.v.). Ruins of the Roman or later F., consisting of a part of the ancient walls, are still visible.

FALERNIAN, a. *fă lĕr'nĭ-ăn* [L. *Falernus* (*Falernus Ager*), an ancient district of Italy in the n. of Campania, between the Massican Hills and the n. bank of the Vulturnus; famous for wine]: of or from Falernus; applied to a wine favorite among the Romans. It is described by Horace as, in his time, surpassing all other wines then in repute. In the time of Pliny, however, Falernian wine had begun to decline in quality, through lack of care in cultivation.

FALIERI, *fâ-lē-ā'rē,* MARINO: abt. 1284–1355, April 17: celebrated Venetian. He was elected 1354, at the age of 70, Doge of Venice, the third of his name called to this supreme dignity. At the siege of Zara, 1346, he defeated an army of 80,000 Hungarians, vigorously carrying on at the same time extensive siege-operations; and in the course of the war, having assumed command of the fleet, captured Capo d'Istria. Subsequently, he became ambassador of the Republic to Rome and Genoa. Of an ungovernable and implacable temper, his bitter resentment seems to have been roused by a grossly offensive libel on his fair and youthful wife, the author of which, a young patrician named Michele Steno, owed some grudge to the doge. The punishment awarded to the young noble by a patrician tribunal seemed to F. wholly inadequate to the offense by which his ducal dignity had been outraged, and in order to avenge this double slight, he organized an audacious plot, with the object of overthrowing the republic, and massacring the heads of the aristocracy, to be followed by his own assumption of sovereign rights. The conspiracy was, however, revealed on the eve of its execution, and F. was arrested, and suffered death by decapitation. In the hall of the great council, which contains the portraits of all the doges, the space allotted to that of F is draped with a veil of sable, and bears the following inscription: 'Hic est locus MARINI FALETRO, decapitati pro criminibus.' A faithful representation of the plot, and of its chief confederates, is in Byron's drama *Marino Falieri*.

FALKIRK, *fâl'kėrk* (local pron. *faw-kėrk'*): Scottish parliamentary burgh, finely situated on rising ground in the midst of a populous mineral and manufacturing district in Stirlingshire, and overlooking an expansive 'Carse,' through which winds the river Forth. F. consists principally of along, irregular street, where there is an equestrian statue to the Duke of Wellington, erected by public subscription 1854. In 1859, a commodious Exchange was built; in 1868, excellent county buildings were erected, a new prison and county police-office. A hall, with accommodation for various studies, was opened 1878, for the Falkirk School of Arts. In 1600, F. was made a burgh of barony by King James VI., in 1646 a burgh of regality by King Charles I. In 1715, it passed to the crown by forfeiture. It has nine yearly fairs, extensive inland trade, various local manufactures, and charitable institutions. Its parish church—the Eglais Bhrec, Varia Capella, or Speckled Kirk of the chartularies and of local tradition—has one or two monuments of some antiquity, but was rebuilt 1810. The church, church lands, and barony belonged of old to the Abbey of Holyrood. Near F., 1298, Sir William Wallace made his masterly retreat from the disastrous battle (see FALKIRK, BATTLE OF), in which he lost his companions in arms, Sir John Graham and Sir John Stewart, both said to be interred in the parish churchyard. The inscribed stone alleged to cover the grave of Sir John Graham, is apparently more modern than his time. In 1746, the neighborhood of F. was the scene of another battle, in which the royal troops were defeated by those of Prince Charles Edward. It is now noted chiefly for its cattle-trysts (cattle fairs), at which stock is yearly sold to the value of about £1,000,000. In the immediate vicinity are the Carron Iron-works. F. is a station on the North British railway, and has water communication by the Forth and Clyde canal. Pop. (1891) 16,615.

FALKIRK, BATTLE OF: between the English and Scotch; near Falkirk, Scotland, 1298, July 22. Wallace had followed up his victory over the English near Stirling 1297, by taking possession of some of the more important fortresses of Scotland. In the following year, King Edward, having returned from Flanders, summoned a great army to meet him at York, and marched northward to Roxburgh, thence along the e. coast of Scotland and the shore of the Firth of Forth. It was not till the day of the battle, that Edward saw his adversaries. The Scottish infantry, much inferior in numbers to the English, were arranged in four circular bodies on a small eminence near Falkirk, armed with lances and with bows and arrows. The cavalry, numbering only 1,000 men, were placed in the rear. This array was charged by the English cavalry. The Scottish footmen bravely withstood the onset of the English horse; but the cavalry, dismayed by the preponderating numbers of the enemy, rode from the field without striking a blow Thus left without support, the spearmen and archers were compelled to yield, and the retreat became general. The loss on the Scottish side is said to have amounted to 15,000 men. The results of this defeat were, that the military power of Scotland, such as it was, was broken; and Edward returned to England master of all the important strongholds of the south.

FALKLAND, *fawk'land:* royal burgh of Scotland, county of Fife, at the n. e. base of the Lomond Hills, 22 m. n. of Edinburgh, 10 m. s.w. of Cupar. The e. Lomond Hill rises so abruptly behind the town as to intercept the rays of the sun from it for several weeks during winter. F. was in early times a manor of the Earls of Fife. It passed from them to the crown 1425, and was made a royal burgh by James II. 1458. Within the town are the remains of Falkland Palace—a large tower (in the same style as the n. w. tower of Holyrood) above a vaulted doorway leading into the courtyard, built about 1500, and two sides of a quadrangle, built between 1530–50, fine and interesting examples of Scottish architecture. The palace was a favorite residence of King James IV., and after his death 1513, his widow, the impetuous sister of King Henry VIII. of England, was here kept in restraint for a season. Here her son, King James V., died 1542. The last king who occupied the palace was Charles II., who passed a few days in it 1650. Of the more ancient castle in which David, Duke of Rothesay, was imprisoned and starved to death by the Duke of Albany, 1402, no traces remain. The people support themselves mainly by handloom weaving. Pop. (1881) 1,068.

FALK'LAND, LUCIUS CARY, Viscount: born, it is believed, at Burford, in Oxfordshire, England, 1610; d. 1643, Sep. 20. He was educated first at Trinity College, Dublin—his father, Henry Cary, Viscount F. being at that time lord-deputy of Ireland—and afterward at St. John's College, Cambridge. His earlier years were devoted to study, and to the conversation of learned men, among whom he himself seems to have occupied a first place. His residence (Burford) was only ten m. from Oxford with its scholarly company. F. is one of those historical personages whose character and abilities we must take, if at all, on the word of friends and panegyrists, like Clarendon; for his deeds and writings are not equal to his fame. In 1633, he was made one of the gentlemen of the privy-chamber to Charles I., and took part in the expedition against the Scots 1639. In 1640, he entered parliament as member for Newport in the Isle of Wight, and was at first distinguished by his patriotic zeal for the laws and constitution of his country. Against such men as Stafford and Finch he used great severity of speech, though even in their case his almost finical love of the forms of legal procedure was manifested. Shortly afterward he conceived it his duty to assume a different political attitude, and to oppose what he deemed the excesses and illegalities of the popular party. On the breaking out of the civil war, he consequently took part with the king, though mourning deeply the miseries which his country was about to suffer. He died a soldier's death at the battle of Newbury. F. was quite unfitted to take a practical part in the sanguinary politics of his time; but his love of the rights of the nation, which burned in him as strongly when a royalist as when attacking Stafford and the bishops, aids us to understand the deep indignation that possessed the English gentlemen who represented the commons, at the arrogant and unprincipled policy of Charles's advisers. F. wrote various treatises, etc., the principal of which is *A Discourse on the Infallibility of the Church of Rome.*

FALKLAND ISLANDS: the only considerable cluster in the s. Atlantic, about 300 m. e.n.e. of the Strait of Magellan, stretching in s. lat. from 51° to 52° 30′, and in w. long. from 57° 40′ to 61° 20′. After having successively belonged to France and Spain, they have, since 1771, formed part of the British empire; and in 1833 they began to be settled, being as a whole, the most southerly of the organized colonies of England. These islands number about 200, presenting a total area of about 6,500 sq. m. The two largest members of the group, E. Falkland and W. Falkland, comprise between them more than half the surface; and of the remainder, the chief ones are Great Swan, Saunders, Keppel, Pebble, Eagle, and Jason. This possession, with its many excellent harbors, is valuable mainly from its position with respect to the Southern and Pacific Oceans. Both the soil and the climate are much better adapted to pasturage than to cultivation. While the natural grass is extremely luxuriant, scarcely anything but a few vegetables is grown in the settlement. The coasts teem with fish, especially cod; and in certain seasons of the year, penguins and seals are killed in great numbers for their oil. The temperature is very different from that of the corresponding parallels in the s. of England, being both lower in summer and higher in winter. The mean of the former season is about 53° F., and of the latter, about 40°. These averages considerably exceed the vague estimates of early navigators, who, coming suddenly down from the tropical heats, appear to have here felt, by comparison, something of hyperborean cold. Though there is no timber worthy of the name, yet peat abounds to the depth of ten ft. Revenue of the colony 1901, £15,476; expenditure, £17,639. The annual value of imports varied 1900-1 from £66,948 to £74,765; of exports (chiefly wool, with oil, hides, tallow, and seal skins), from £111,539 to £108,294. There is some gardening near Stanley, the seat of government; and a little barley and oats is cultivated. There is only one indigenous quadruped found, a kind of fox. Large cattle are now numerous. The sheep are chiefly Cheviots and Southdowns. There are deposits of guano on W. Falkland. The governor, the executive council, and the legislative council of the F. I. are appointed by the crown. Pop. (1871) 803; (1880) 1,336; (1887) 1,843; (1901) 2,043.

FALL, n. *fawl* [Icel. *falla;* Dut. *vallen,* to fall—connected with Gr. *sphallo,* I cause to fall]: the act of dropping or coming down from a higher to a lower place; descent; that which falls; a tumble; ruin; apostasy; decrease of price or value; a rush of water down a steep place; autumn; in *OE.*, cadence: V. to drop or come down from to higher to a lower; to descend; to depart from the faith; to perish; to decrease in price or value; to flow into, as a river; to sink; to come in or upon; to forsake; to happen; in *OE.*, to bring forth. Fal'ling, imp.: Adj. descending; dreoping; declining. Fell, pt. *fĕl.* Fallen, pp. *fawl'n:* Adj. degraded; ruined; deereased. Fallible, a. *făl'lĭ-bl* [L. *fallibĭlis*—from *fallĕrĕ*, to deceive]: liable to error or mistake. Fal'libly, ad. *-blĭ.* Fal'libil'ity, n. *-bĭl'ĭ-tĭ,* liability to err or be deceived. Faller, n. *-ėr,* one who falls; in *machinery,* an arm on a mule-carriage, operating the faller-wire, whose duty it is to depress the yarns when the carriage is about to run back; also a bar in the flax spreading machine, to which are attached a number of vertical needles, forming a comb or gills, which simulate the action of the human fingers in detaining to some extent the line as it passes to the drawing roller. Falling-home, a. in *naut.*, term applied to the upper parts of the sides of a ship when they curve inward. It is called also tumbling home, and formerly, too, hausing-in. It is the opposite of wall-sided or flaring-out. Falling-molds, n. in *carp.*, the two molds which are applied, one to convex, the other to the concave vertical side of the rail-piece in hand-rails to form its back and under surface, and to finish the squaring. Falling-off, n. degeneracy; change to the worse; in *naut.*, the opposite of *griping* or *coming-up* to the wind. It is the movement or direction of the ship's head to leeward of the point whither it was lately directed, particularly when she sails near the wind or lies by; the angle contained between her nearest approach to the wind. Fall-cloud: same as Stratus. Fall-poison, in *bot.*, name in the United States for a melanthaceous plant, *Amianthium muscætoxicum,* so called because cattle feeding on its foliage in the fall of the year are poisoned. Falling-sickness, epilepsy (q.v.). Falling-stars, the familiar name for the meteorites seen in a state of combustion in the sky (see Meteors). Falling stones, a familiar term for meteoric stones. To fall astern, among *seamen,* to be passed or left behind: to move or be driven backward, as by a current. To fall away, to lose flesh; to apostatize; to fade. To fall back, to recede; to retreat. To fall back upon, to retreat for safety toward supports, as troops; to betake one's self to a reserved fund or a reliable resource for support. To fall down, to come to the ground; to prostrate one's self in worship. To fall foul, to attack; to come into violent contact; to become entangled. To fall from, to recede from; to depart. To fall in, to agree with; to enter among, as a body of soldiers arranged; to join. To fall in with, to meet with, as a ship; to discover. To fall off, to withdraw; to forsake; to depreciate; to become less. To fall on, to begin suddenly and eagerly;

to rush against. To FALL OUT, to quarrel; to happen; to quit the place in the ranks. To FALL OVER, to change sides. To FALL SHORT, to be deficient. To FALL TO, to begin; to apply one's self to. To FALL UNDER, to come under or within the limits of. To FALL UPON, to attack. THE FALL OF THE LEAF, autumn: see DECIDUOUS TREES: LEAVES. THE FALL, the state of sin and misery into which our first parents were brought by their eating the forbidden fruit; the act itself; the autumn, when leaves fall.

FALL, n. *fawl* [F. *faille*, a fishing net]: a short veil worn over the bonnet by females; a veil.

FALL, n. *fawl* [O.Sw. *fale*, a pole or perch]: in *Scotland*, a measure nearly equal to an English perch or rood.

FALL, int. *fawl:* in *naut.*, the cry to denote that a harpoon has been effectively delivered into a whale.

FALL, DOCTRINE OF, in Theology: doctrine of the historical introduction of evil into the world, based on the narrative in Genesis, chap. iii., with other portions of the Bible which refer to the events there recorded. The doctrine assumes various forms, according to the interpretations which the record receives. Some theologians interpret the narrative more literally—though none do so quite literally;—others interpret it more figuratively as a poetic instruction; while others reject it altogether as a narrative, and look upon it merely as a mythical story of the early time—mirroring the lapse from a primitive golden age, or age of innocence.

1. Even the most orthodox theologians to some extent spiritualize the narrative, or regard it figuratively. The serpent, for example, is with them the devil, though the text in Genesis itself gives no hint of such an interpretation, which ultimately appears in the New Testament. The enmity between the serpent and the woman is the enmity between the devil and mankind; and the bruising of the head and the heel is supposed to represent the victory—though not without suffering—of Jesus Christ, as the Messiah, over the devil. Other particulars, less important, are conceded to be figurative. The doctrine of the Fall, according to the prevalent interpretation of orthodox divines, is stated in the Westminster Confession of Faith, c, vi.: 'Our first parents being seduced by the subtlety and temptation of Satan, sinned in eating the forbidden fruit. By this sin, they fell from their original righteousness, and communion with God, and so became dead in sin, and wholly defiled in all the faculties and parts of soul and body. They being the root of all mankind, the guilt of this sin was imputed, and the same death in sin and, corrupted nature conveyed to all their posterity, descending from them by ordinary generation.'—This definition, however, probably asserts more than multitudes of believers in both the narrative and the doctrine, now deem it necessary or desirable to assert. They are not anxious to criticise the narrative as though it were a logical formal statement, and they have little care to classify it according to certain liter-

ary rules. Their ideas are not entangled in its mere garb or form. They take note of the main spiritual facts which it presents, and observing that these accord with all human history and experience, and that the most recent science gives some of them—e g. the fact of heredity—increasing emphasis, they accept the main facts—the important meaning of the story; and thus accept the story as a true spiritual symbolism, and further, as true historically so far as its history is at all requisite for a vehicle of its deep ruths.t The *doctrine* of the fall which probably is the frequent result of such a view, may be generally stated thus: The first man was tempted by an evil spirit to disobey God; he yielded, and thus sin entered into the world, human nature fell into ungodiliness; and all mankind, descending from the first man, have inherited a proneness to depart from God. This inherited evil manifests itself as sin in men soon as the moral nature issues into action. Restoration for the individual or for the race is only through a new importation of the lost Divine life by the coming in human flesh of the eternal Son of God, who was manifested as 'the seed of the woman' that he might redeem man and 'destroy the works of the devil.' Humanity, which fell in the first Adam, rises again and far higher in the second Adam.

2. Other theologians consider the third chapter of Genesis in the main allegorical—representing a picture of the violence of appetite in our first parents. More definite as to the form of the narrative, they tend to be less definite as to the doctrine. In this view, the serpent is a mere imaginary accessory—the emblem of temptation; the supposed interview between God and our first parents is of the same character—the emblem of the voice of conscience following unlawful indulgence: the tree of the knowledge of good and evil represents some form of sensual indulgence. The only realities in the picture are the moral realities, conscience and temptation in some carnal form—realities which were no more powerful in the case of our first parents than they are in the case of all their descendants who yield to unlawful indulgence, as they did. The doctrine of the Fall, according to this interpretation, is simply the doctrine of the abuse of free will in our first parents; and the question of the relation of this primary sin to all subsequent sin, is variously regarded by this class of theologians. All of them would repudiate any formal imputation of it; yet all or most allow some actual transmission or inheritance of corrupted will, as the consequence of the original abuse of it.

The Pelagian theory maintained, indeed, that the race was not the worse for Adam's fall; but that, as our first parents 'were to blame for yielding to a temptation which they might have resisted, so all of us, by a proper attention in cultivating our natural powers, may maintain our innocence amid the temptations with which we are surrounded: and, therefore, that we fall short of that which it is in our power to do, if we do not yield a more perfect obedience to the law of God than Adam yielded.' The Arminian theory, again contended that the chief loss of the race, as the consequence of the transgression of our first parents, was the subjection to death thereby incurred, and the moral disadvantages arising out of the fear of death. Others, more othodox than either, contend that the spiritual unity of the race necessarily implies that the depraved will of our first parents has descended to their posterity as their unhappy portion.

3. The opinion of those who look upon the chapter in Genesis as a mere myth or fable, representing a dream of the religious imagination, without any special moral meaning, cannot be said to come within the pale of Christian theology, The doctrine of the Fall is with them only a devout idea, inconsistent with their principles of philosophy and history, and which, accordingly, they dismiss from their speculation or concern altogether.

FAL-LA, n. *făl-lâ'* [derived from *fal la*, with which each line or strain ended]: in *mus.*, a short song with the syllables *fal la* at the end of each line or strain. Morley about 1580), who composed some of them, speaks of their being a kind of ballet. Those of Hilton (about 1600) are held in the highest estimation for freedom of construction and beauty of melodies. Gustildi is the reputed inventor of *fal-las.*

FALLACIOUS, a. *făl-lā'shŭs* [L. *fallācĭōsus*, deceitful—from *fallo*, I deceive: F. *fallacieux*]: deceiving; deceptive; not well founded; producing error or mistake. FALLA'CIOUSLY, ad. *-lĭ*. FALLA'CIOUSNESS, n. FALLACY, n. *făl'-lă-sĭ* [F. *fallace*, deception, a fallacy—from L. *fallācĭă*]; that which misleads the eye or the mind; deceptive appearance; a sophism.

FAL'LACY: incorrect performance of the process of reasoning, so as to lead to error. The science of Logic (q.v.) reduces sound reasoning to certain rules, and when any of these rules is violated, a logical F. is the result. There is always included in logical treatises a chapter on fallacies, in which the several kinds are classified and illustrated. In all the old writers, there was a division into two classes, according as the error lay in the *form* of the reasoning, or in the *matter;* the formal were entitled *in dictione*, or those appearing in the expression; the material were entitled *extra dictionem*, implying that the fault must be sought in a consideration of the meaning or subject-matter. Some of the designations of this ancient classification have passed into common use; as follows:

The formal, those *in dictione*, were direct breaches of the laws of syllogism, or of argumentation from premises (see SYLLOGISM: DEDUCTION). The fallacy of *undistributed middle* is one of the cases where what is called the middle term of a syllogism is used in two senses. 'A term is said to be "distributed" when it is taken universally, so as to stand for everything that it is capable of being applied to; and, consequently, is "undistributed" when it stands for a portion only of the things designated by it. Thus, "all food," or every kind of food, are expressions which imply the distribution of the term "food;" "some food," would imply its non-distribution.' In such a proposition as 'all food is obtained from the vegetable or animal kingdom,' the term is distributed, because it is meant to be affirmed of every article used as food, that such article is derived from one or other of these two sources. But when we say 'food is necessary for life,' we mean only a limited number of articles. Hence such a syllogism as the following: 'Food is necessary to life; corn is food; therefore corn is necessary to life,' is faulty from undistributed middle; the major proposition, 'food is necessary,' etc., has the form of a universal proposition, with the reality of a particular one.—The *æquivocatio*, or *ambiguous middle*, is the case where a word is used in two senses so different as to give properly no middle term, and, therefore, no connecting link between the premise, and the conclusion. A favorite example of this is the following: 'Every dog runs on four legs; Sirius (the dog-star) is a dog; therefore Sirius runs on four legs.' This is merely playing with the ambiguity of a word. Dr. Whately has shown that this F, may often arise with words derived from the same root, but acquiring from usage different significations; thus, 'projectors are unfit to be trusted; this man has formed a *project*, therefore he is unfit to be trusted;' where the argument supposes that the meaning of 'projector' and 'one who has formed a project' is the same, which it is not.—The F. of *composition and division* arises by using a word distributively that is meant collectively: thus, 'five is equal to two and three; two and three are even and odd; therefore five is even and odd.'—'The F. of *accent* was an ambiguity arising from pronunciation. Thus, by a false accent in reading the commandment, "thou shalt not bear false witness against thy neighbor," it might be suggested that *subornation* is not forbidden, or that anything false except *evidence* is permitted, or that false evidence may be given *for* him, or that it is against *neighbors* that false witness is not to be borne.'—The *fallacia accidentis* is another form of the ambiguous middle. It is when we conclude of a thing something that is true of it only accidentally, as 'wine is pernicious, therefore it ought to be forbidden.' The premise is true of only the immoderate use, the conclusion refers to its use in every form. Another F., the converse of this, is arguing *a dicto secundum quid ad dictum simpliciter* (passing from what is true in some respect to what is true absolutely). Of this the stock example is: 'What you bought yesterday you eat to-day; you bought raw meat yesterday, therefore you eat raw meat to-day.'

The most usually quoted of the second class of fallacies —*extra dictionem*—are the following:—*Ignoratio elenchi*, or 'ignorance of the refutation.' This means mistaking the point in dispute; or proving something that an opponent does not deny. This is common in controversy. See an example in ETHICS.—The *petitio principii*, or 'begging of the question.' This is when, instead of proving a position by some different position, something is assumed that is identical with what is to be proved. The most common form of this F. is what is termed *reasoning in a circle*, where two propositions are made reciprocally to prove each other. The following would be an example of this mode of reasoning: Suppose we asked why smoke ascends, and any one were to answer, 'because it is light;' we then inquire how it is known to be light, and the reply is, 'because it ascends.'—The *non causa pro causa*. This is a F. of insufficient induction (see INDUCTION), or the inferring a connection of cause and effect where there is a mere sequence or accompaniment; as when we allege that the prosperity of England is due to its having an aristocracy, or an Established Church, or any other circumstance that has attached to the country, without ascertaining that there is any real causation between the two facts. Much of empiricism in medicine is of this nature; such a one took a certain medicine, and recovered from an illness, therefore the medicine was the cause of the recovery. The *post hoc, ergo propter hoc*, is another expression for the same F., which is one of wide range, and whose rectification far transcends the limits of scholastic or formal logic.—The *argumentum ad hominem* is a reference to the circumstances of the party addressed, and means that though a certain reasoning may be good in itself, such party is not entitled to urge it, having perhaps already repudiated the same reasoning in other cases, or acted in a manner inconsistent with the employment of it. (For a full exemplification of fallacies according to the foregoing enumeration, see De Morgan's *Formal Logic*, Whately's *Logic*, Sir William Hamilton's *Lectures on Logic*, etc.)

The subject of fallacies has received a much more comprehensive treatment in the work on Logic by John Stuart Mill, who has enlarged the basis of the science itself, by placing Induction at the foundation of Reasoning, and by recognizing the necessity of laying down rules for the correct performance of that process: see INDUCTION. This enables him to give a proper place to some of the preceding fallacies, such as the *post hoc, ergo propter hoc*, which, though occurring in treatises of syllogistic logic, does not violate any rule either of syllogism or of any process included in such treatises. In fact, if we take a complete view of all the cardinal operations that enter into the establishment of truth by evidence, we ought to enumerate four such operations—Observation, including experiment; Definition, or the right use of general terms; Induction; and Deduction or syllogism. Now any one of these operations badly performed would necessarily lead to a wrong result, in other words, a fallacy. But in addition to the mistakes arising from the admission of insufficient evidence at any point, there is a class of errors (as well as truths) that arise from our receiving propositions without any outside evidence at all, on the ground that they are self-evident. In every case of reasoning we must come at last to something that does not need a reason, as, for example (as a general principle), the evidence of our senses, or our actual observation, but we may sometimes admit as self-evident what is really not so, owing perhaps, to our having a strong sentiment in the matter on hand. It is usual to consider the existence of an external material world altogether independent of our minds, as certain in itself without requiring any proof or reason for the belief. It is found that we often commit mistakes in this way, and the mistakes thence arising Mr. Mill illustrates under the title of Fallacies of Simple Inspection, or Fallacies *à priori*, which includes the whole of what may be termed Natural Prejudices. The other members of his classification follow his division of the processes concerned in the investigation of truth: They are Fallacies of Observation, Fallacies of Generalization, including Induction, and Fallacies of Ratiocination or syllogism. He remarks, moreover, that error does not often take the form of a deliberate infringement of the rules of good observation, induction, or deduction, but consists rather in a confused perception of the premises involved. In other words, it is the 'not conceiving our premises with due clearness, that is, with due fixity; forming one conception of our evidence when we collect or receive it, and another when we make use of it; or unadvisedly, and in general unconsciously, substituting, as we proceed, different premises in the place of those with which we set out, or a different conclusion for that which we undertook to prove. This gives existence to a class of fallacies which may be justly called Fallacies of Confusion; comprehending among others, all those which have their source in language, whether arising from the vagueness or ambiquity of our terms, or from casual associations with them.' It is in this group that Mr. Mill places the *petitio principii*, the *ignoratio elenchi*, and ambiguous language generally (*Logic*, Book v.).

The scholastic fallacies were considered mostly in the light of weakness or involuntary errors of the intellect, to be corrected by sound rules or a good method of procedure. The syllogistic logician made little count of the natural prejudices, or strong emotions and passions of mind, which forcibly pervert the intellectual views, and render men averse to sound reasoning. This grand omission was first effectively supplied in the immortal first book of the *Novum Organon* of Lord Bacon, who, in a vigorous and telling exposition, set forth some of the most powerful prejudices of the natural mind, and their influence in corrupting science and philosophy as well as the everyday judgments of mankind. Under the name of 'idola' (idols, vain images in the mind), he classed four different species of these moral sources of error, against which the mind had to be fortified, not by syllogistic rules, but by a self-denying discipline, and a highly cultivated perception of the true end of science, which was to increase human power in all the arts of life. His first class of idola were *idola tribus,* or delusions common to the human mind generally, such as errors of the senses, the over-susceptibility of the mind to impressions of sense, the limits of the human faculties, and the interference of prejudices and passions; a very comprehensive class, which even he has failed to do justice to. The next class are *idola specûs* (idols of the den or cavern), by which he understands the peculiarities and idiosyncrasies of individuals. The third class, *idola fori* (idols of the market or of the place where men assemble and exchange views) are intended to include the abuses of language, or the various ways in which our conceptions of things are distorted by names. The last class are the *idola theatri* (theatrical illusions), under which he rebukes the great system-builders of antiquity, such as Aristotle, for introducing fanciful and irrelevant considerations into philosophy; and dwells especially on the corrupting influences of superstition and speculative theology, also on the poetical tendencies of the mind, which are not satisfied with truth unless it can take on a certain warmth or brilliancy of coloring.

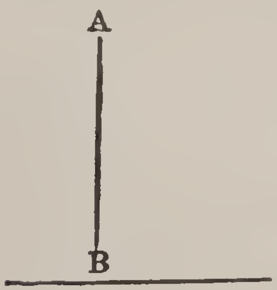
FALLIBILITY, FALLIBLE: see under **FALL 1.**

FALL'ING BOD'IES: substances descending toward the earth's centre. Owing to gravity (q.v.), all terrestrial bodies, if unsupported, *fall*, or move toward the earth's centre. The theory of the descent of bodies under gravity was discovered and first taught by Galileo (q.v.). When a falling body is absolutely without support, it is said to fall freely, as distinguished from one descending an inclined plane or curved surface.

1. *Bodies falling freely.*—The first fact of observation regarding falling bodies is that they fall with a variable velocity; from this we infer that they are acted upon by some force. Again on observing how the velocity varies, we find that its increments in equal times are equal; from this we conclude that gravity is a uniform force, which it is, at least sensibly, for small distances above the earth's surface. We have next to find a measure for this force. By experiment, it is found that a body in 1″ falls through 16·1 ft., and that at the end of 1″ it moves with such a velocity, that if it continued to move uniformly after the 1″ expired, it would pass over 32·2 ft. in the next second. Hence 32·2 ft. is the measure of the velocity which has been generated in 1″, and is therefore the measure of the accelerating force of gravity; for the measure of accelerating force is the velocity which it will produce in a body in a second of time. The quantity 32·2 ft. is usually denoted by the letter g; and it is to be noted that this quantity measures the accelerating force of the earth's attraction on all bodies. Experiment shows that under the exhausted receiver of an air-pump all bodies fall with equal rapidity, and that the difference of velocities of falling bodies in air is due entirely to the action of air on them.

As the accelerating force is uniform, it follows that the velocity generated in any time, t, will be given by the formula $v = gt$. Since the force is uniform, it must generate an equal velocity every second. In t'', therefore it must generate a velocity gt, since it produces g in 1″. In 2″, a falling body will be moving with a velocity of 64·4 ft.—i.e., were the velocity to become constant for the third second, it would in that second move through 64·4 feet.

We are now in a position to inquire more particularly how bodies fall, and to answer such questions as first: What time will a body falling freely take to fall through a given space? Second: What velocity will it gain in falling through a given space? Third: How high will a body ascend when projected straight up with a given velocity? etc. Let A be the point from which a body falls, and B its position at the end of the time t; and let $AB = S$. Then we know that at B the body has the velocity gt. Suppose, now, the body to be projected upward from B toward A with this velocity gt—gravity acting against it, and tending to retard its motion. We know that at the end of a time t it will be again at A, having exactly retraced its course, and lost all the velocity with which it started



from B, because gravity will take just the same time to destroy the velocity gt which it took to produce it. From this consideration we may obtain an expression for the space AB or S in terms of the time t. In the time t, the body rising from B with a velocity $= gt$ would ascend, if not retarded, a height $(gt) . t$, or gt^2. But in the time t, gravity, we know, carried it through S; it will therefore, in the same time, by retarding it, prevent it going to the height gt^2 by a space $=$ S. The space through which it actually ascends is then represented by the difference $gt^2 -$ S; but this space we know to be AB or S. Therefore $S = gt^2 - S$; or $2S = gt^2$, or $S = \frac{1}{2}gt^2$. We may give this equation another form. For v being the velocity acquired in the time t, $v = gt$, $\therefore t = \frac{v}{g}$. Then $S = \frac{1}{2}g . \frac{v^2}{g^2} = \frac{v^2}{2g}$. Hence $v^2 = 2gS$. From these formulæ, we see that when a body falls from rest under the action of gravity, its velocity at any time varies as the time, and the square of its velocity as the space described.

If the body instead of starting from rest has an initial velocity V; and if v, as before, be the velocity at the time t, then evidently v is $=$ the original velocity $+$ that which is generated by gravity, or $v = V + gt$; and the space will be that which would have been described by the body moving uniformly with a velocity V $+$ that which it would describe under gravity alone, or $S = Vt + \frac{gt^2}{2}$ With regard to the last two formulæ, it is easy to see that they may be made to suit the case of a body projected upward with a velocity V, by a change of signs; thus, $v = V - ft$, and $S = Vt - \frac{gt^2}{2}$; gravity here acting to destroy velocity, and diminish the height attained. From the general formulæ in the case of an initial velocity, whether the body be projected upward or downward, we may express v in terms of S, as we did in the case of motion from rest. For

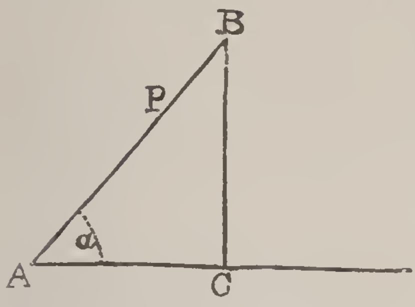
$$v^2 = (V \pm gt)^2 = V^2 \pm 2g\,(Vt + \frac{gt^2}{2}) = V^2 \pm 2gS.$$

These are all the formulæ applicable to the case of falling bodies, and by their means all problems in this branch of dynamics may be solved. It appears also that the formulæ above investigated apply to all cases of rectilinear motion of bodies considered as particles under the action of any uniform force. In all such cases, if f measure the accelerating force $S = \frac{1}{2}ft^2$, $v^2 = 2fS$, for the case of motion from rest; and $S = Vt \pm \frac{1}{2}ft^2$, and $v^2 = V^2 \pm 2fS$, for the case of an initial velocity.

Any one can easily frame for himself examples illustrative of the formulæ. We subjoin one: A stone falls down a well, and in 2″ the sound of its striking the bottom is heard. How deep is the well? Neglecting the time occupied in the transmission of sound, the formula $S = \frac{1}{2}gt^2$ applies, or S $=$ depth $= \frac{1}{2}g . 2^2$, t being 2″; $\therefore$ depth $= 2g$, or 64·4 feet.

2. *Bodies descending inclined planes.*—In this case the for

mulas already investigated apply with a slight change. In the figure, if P be a body on the inclined plane AB, descending under gravity we observe that only that resolved part of gravity parallel to AB is effective to make it descend, the other part at right angles to AB merely producing pressure on the plane. The angle of inclination of the plane being a, we know (see COMPOSITION and RESOLUTION OF FORCES) that the resolved part of gravity parallel to the plane is g sin. a. The body, then, may be conceived to be descending under a uniform accelerating force g sin. a. We obtain the formulæ, accordingly, for descent on inclined planes by substituting g sin. a for f in the general formulæ given above. We notice, however, that in descent on inclined planes the velocity acquired is, as in the case of bodies falling freely, due solely to the vertical height through which the body falls. By our formula, $v^2 = 2g \text{ sin. } a \,.\, \text{S}$, where S = AB, if the body falls from B. This may be written $v^2 = 2g \,.\, \text{S} \,.\, \text{sin. } a$, or $= 2g \,.\, \text{AB} \,.\, \text{sin. } a$, or $= 2g \,.\, \text{BC}$, since AB . sin. a = BC. But this is the same as the velocity acquired by a body in falling freely through BC. In fact, it holds generally true, that the velocity acquired by a body falling down the surface of any smooth curve is that due to the vertical height through which it has fallen; which might be proved in various ways, but is sufficiently clear from this, that any curve may be considered as a succession of inclined planes, indefinitely short in length and great in number; for the proposition being true, as above proved, for each of them, will be true for all, and therefore for the curve.



For an account of the variations of the value of g, due to the earth not being a perfect sphere, and other causes, see EARTH: see also ATWOOD'S MACHINE.

FALLMERAYER, *fâl'mĕh-rī-ĕr*, JACOB PHILIPP: 1791, Dec. 10—1862; b. Tschotsch, near Brixen in the Tyrol: German traveller and historian. He studied at Brixen, and 1809 went to Salzburg, where he gave instruction in history and Latin. At the Univ. of Landshut, he studied law, history, and philology. When Germany rose against Napoleon 1813, he entered the Bavarian army, and took part in several engagements. After peace F. returned to his studies. In 1826, he was appointed to the chair of history and philology at Landshut. In 1831, he accompanied the Russian gen., Count Ostermann-Tolstoy, in a journey to the East, visiting Egypt, Palestine, Syria, Cyprus, Rhodes, Greece, Turkey, and Italy. During 1830–40, he resided with Count Ostermann-Tolstoy at Geneva, and in the next eight years twice revisited the East. The events of 1848 recalled him to Bavaria, and for a short time he sat as a deputy to the Frankfurt parliament, but after 1850 he lived privately in Munich. F. was a distinguished polyglot, and spoke a great number of European and Oriental tongues. His principal works are, *Geschichte des Kaiserthums Trape-*

zunt (Münch. 1831), *Geschichte der Halbinsel Morea im Mittelalter* (2 vols. Stuttg. 1830–36), and *Fragmente aus dem Orient* (2 vols. Stuttg. 1845). His views on the origin of the modern Greek language have excited the liveliest controversy in Greece and elsewhere. A complete ed. of F.'s works appeared at Leipsic 1861, entitled *Gesammelte Werke von Jakob Philipp Fallmerayer.*

FALLOPIAN, a. *făl-lō'-pĭ-ăn* [from *Fallōpĭŭs,* reputed discoverer]: in *anat.*, denoting certain ducts or tubes through which the ova pass to the uterus.—The Fallopian Tubes, or oviducts, are named after Fallopius usually but incorrectly regarded as their discoverer. They are canals four or five inches in length in the human subject, opening at their inner extremity into the upper angle of the uterus or womb, and at the other end, by a fringed funnel-shaped termination, into the cavity of the peritoneum. This fringed or fimbriated extremity at certain periods grasps the ovary, and receives the ovum, which is discharged by the rupture of the Graafian vesicle: see OVARIES. The ovum usually passes along the Fallopian tubes into the uterus, where it is either impregnated by contact with one or more spermatozoa, or is absorbed. Sometimes, however, the ovum becomes not only impregnated but retained, and further developed in the Fallopian tubes, thus giving rise to one of the forms of extra-uterine pregnancy.

FALLOPIUS, *fâl-lō'pĭ-ŭs,* GABRIEL: celebrated anatomist; b. at or near Modena, about 1523 (quite uncertain); d. 1562. According to the above date he was only 25 years old when promoted from the Univ. of Ferrara to a professorship at Pisa, whence, after a few years, he was called to Padua, to succeed Vesalius, who had been compelled by the Inquisition to resign his office: see VESALIUS. Cuvier characterizes F. as one of the three *savants* who restored rather than created the science of anatomy in the 17th c., the two others being Vesalius and Eustachius. After his short but brilliant career was ended by death, he was succeeded by his favorite pupil, Fabricius ab Acquapendente (q.v.).

He published numerous works in various departments of medicine, of which the most important is *Observationes Anatomicæ, in libros quinque digestæ,* 1561, in which he corrected many errors into which his predecessor, Vesalius, had fallen. He was the first to describe with accuracy the ethmoid and sphenoid bones, and the minute structure of the ear (the canal along which the facial nerve passes, after leaving the auditory, is still known as the aqueduct of Fallopius); the muscles of the soft palate, and the villi and valvulæ conniventes of the small intestines. In some of his supposed discoveries, he had been long anticipated; for example, the tubes passing from the ovary on either side to the uterus, which bear his name, were known to, and accurately described by, Herophilus and Rufus of Ephesus, 300 years B.C. In addition to his anatomical fame, he had reputation as a botanist: he was supt. of the botanical garden at Padua; and a genus of plants, *Fallopia,* has been named after him. A complete ed. of his works, four folio vols., was published 1600.

FALLOUX, *fâl-lô′*, FRÉDERIC ALFRED PIERRE, Comte DE: French author and statesman; b. Angers, 1811, May 11. His family was distinguished for its legitimist zeal, and at the Restoration was rewarded by letters of nobility. Young F. first drew attention by two works showing ardent love of the old Bourbon order of things—*L'Histoire de Louis XVI.* (Paris 1840, and *L'Histoire de Saint Pie V., Pape, de l'Ordre des Frères prêcheurs* (Paris 1844). These indicate the level of his political and religious faith. In the elections of 1846, he was chosen deputy for the dept. Maine-et-Loire. In religion, he advocated the ideas of Montalembert; in politics, those of Berryer, but united with his legitimist sentiments a love of liberty and education strangely incongruous with the historic character of his party. After the revolution of 1848, Feb., he showed much energy as a member of the constituent assembly, was one of those who organized the resistance to the insurrection of May 15, and, as reporter on the national workshops, pronounced for their immediate dissolution. He was also one of the most ardent promoters of the expedition to Rome. After the election of Louis Napoleon to the presidency, F. was appointed minister of public instruction, an office which he held only ten months. After the events of 1851, Dec. 2, he retired from public life to a country seat near Angers, where he has occupied himself with agriculture. In 1857 he was admitted a member of the French Acad., and published at Tours his *Souvenirs de Charité.* He published, 1859, *Mme Swetchine, sa Vie et ses Œuvres;* 1863, *Méditations et Prières;* 1864, *La Convention du 15 Septembre;* 1865, *Itinérarie de Turin à Rome;* 1866, *Lettres inédites de Mme. Swetchine.*

FALLOW, a. *făl′lō* [F. *fauve;* OF. *falve,* a deep yellow —from Ger. *falb,* pale: AS. *fealo,* pale-reddish, or yellowish]: applied to a species of deer (see below): in *OE.*, pale-brown, with tinge of red or yellow.

FALLOW, a. *făl′lō* [AS. *fealo,* yellowish: Icel. *fölr,* pale: Dut. *vaal,* fallow, faded: Scot. *fail,* a sod or turf: Sw. *vall,* sward: prov. Dan. *fælde,* to give a first shallow plowing: comp. Gael. *falamh,* empty]: applied to land which has lain a year or more untilled; denoting land plowed but not seeded for the season; neglected: V. to plow up land without seeding it. FAL′LOWING, imp.: N. the operation of plowing land not meant to be sown. FAL′LOWED, pp. *-lōd,* plowed and opened up to the air for the season. FAL′LOWNESS, n. exemption from bearing fruit. To LIE FALLOW, to lie uncropped; to rest; to remain unexercised. —*Fallow* signifies sometimes waste, untilled land; but usually plowed and otherwise stirred for a season without being cropped. The most of the wheat raised by the Romans was sown after the land was fallowed; indeed, the usual rotation was fallow and wheat alternately. It was only fertile soils that could long support such an exhausting system; hence resulted the decreasing produce which the later Roman agricultural authors so often lament.—The fallowing of land was introduced into all the countries which fell under the dominion of the Romans. During their sway in Britain, that country soon exported large quantities of wheat; and for centuries after the Romans left it, no other mode of cultivating the land was followed. Wherever the system of fallowing, without giving manure to the crops, is practiced, it necessarily supposes that the soil is at least moderately fertile. This system is most successful on argillaceous soils, retentive of organic manure. It must be borne in mind that the chief use of fallow is to liberate the plant-food already stored in the soil as organic matter. The plowing and stirring, by admitting air, promote decomposition, in the same manner as the turning over of a dunghill does; they also destroy the roots of the weeds that impoverish and choke the crops. In the most retentive clay-soils, fallowing affords the only means of thoroughly cleaning the land. Where there is a rotation of beans, clover, oats, fallow, wheat, and barley, each field is subjected to a process of fallowing once in every six, seven, or eight years. Fallow-fields usually receive a deep furrow in autumn. Lying exposed through the winter, the frost pulverizes the surface. In spring, when the weather becomes dry, the cultivator or the plow opens up the soil, and the process of extirpating the weeds goes on. Sometimes as many as three or four furrows are given in summer before the seed is sown in autumn. In old cultivated countries, land is commonly so much reduced in its organic matter, that fallows receive dressings of farm-yard manure, rape-dust, or guano, to obtain fertility. Since the general introduction of green crops, the term fallow has departed in some measure from its original meaning. These crops are sown on what was formerly the fallow-break, and are now often styled fallow-crops. The land, no doubt, receives in some measure a fallowing, as the green crops are cultivated by the plow during their growth. Bastard-fallowing is a term used in Scotland when hay-stubble land is plowed in the end of summer, freed from weeds, and sown with wheat in autumn.

FAL'LOW CHAT: see WHEATEAR.

FAL'LOW DEER (*Dama valgaris* or *Cervus Dama*): species of deer commonly kept in *parks*, in most parts of Europe. It is probably a native of the countries around the Mediterranean, and has been introduced by man into the more northern parts of Europe, where it is now in some places found wild in forests. It is doubted whether it has not been introduced by man, at a remote period, from n. Africa even into the south of Europe. How far its geographic range extends eastward, is not certainly known. It is represented in the sculptures of Nineveh. Its introduction into Britain is ascribed to James VI. of Scotland, who is said to have brought it from Norway when he brought home his queen, Anne of Denmark, and after his accession to the English throne, to have transported it to Enfield and Epping. Thousands of F. D. are now in some of the English parks. They generally receive some attention and supplies of fodder in winter.

In size, the F. D. is smaller than the stag or red deer, from which it differs also in its broad palmated antlers, longer tail, and smoother and finer hair. In color, it is generally yellowish brown in summer; darker, or even blackish brown in winter; more or less spotted with pale spots, particularly in summer and when young; but in one variety the spots are very marked; in another they are not to be observed even in the young. The buttocks are white, and a dark line passes along the back. White F. D. are sometimes seen. The female has no horns. The male is called a Buck (Fr. *daim*), the female a Doe (Fr. *daime*), the young a Fawn (Fr. *faon*). The name F. D. is derived from its color. When the F. D. and red deer are kept in the same park, the herds seldom mingle, nor do hybrids occur. The F. D. loves the woods. The flesh of the F. D. is one of the most esteemed kinds of venison. The remains of fossil species nearly allied to the F. D. occur in some parts of Europe. The great fossil Irish *Elk* (q.v.) is allied to it.

Fallow Deer (*Cervus Dama*).

FALL RIVER: city, manufacturing centre of Bristol co., Mass.; on Taunton River, Mount Hope Bay, and the R. I. border; on the Old Colony Providence Warren and F. R., and the F. R. and New Bedford railroads; lat. 40° 42′ 3″ n., long. 71° 9′ 37½″ w., 13 m. n.w. of New Bedford, 18 m. s.e. of Providence, 19 m. n.n.e. of Newport, 20 m. from the sea, 48½ m. s. of Boston. F. R. is built on a bold, dome-like elevation rising out of Mount Hope Bay, an e. branch of Narragansett Bay, and rests upon an immeasurable bowlder of granite, or primitive rock. A single creek from Watuppa Lake on the plateau e., crossing the city and making a headlong plunge into the bay near the present sound steamboat landing, gave it its name. F. R. counts among its advantages as a manufacturing place a remarkably fine head of water—a fall of more than 130 ft. in a run of less than half a mile, and a splendid harbor at the head of Mount Hope Bay. Its wharves are accessible to the largest steamships. The city is beautifully laid out, contains numerous buildings of granite quarried in its vicinity is supplied with water from Watuppa Lake by works that cost $1,500,000, has a public park with an area of 60 acres, is lighted by gas and electricity, has an efficient fire department, and ample street railway service. Its notable buildings include a handsome granite city hall, Rom. Cath. convent, custom house, free public library and reading room, children's home, high school, 7 grammar schools 23 intermediate schools, 32 primary schools, 7 national banks (cap. $2,250,000), 4 savings banks, 2 private banks, and 35 churches: Rom. Cath. 9, Meth. Episc. 8, Congl. 4, Prot. Episc. 3, Christian 3, Bapt. 2, Presb. 2, Unit., Friends, Mormons, New Jerusalem, 1 each. Its chief industry is the manufacture of cotton. The first cotton mill erected here, subsequently turned into fruit works, was built 1811; and the first manufacturing enterprise of any moment began 1813, when two companies were formed, one with a cap. of $50,000, the other with $40,000. In 1865 there were 265,328 spindles in operation; 1869, 540,614; 1876, 1,269,048; 1892, 2,208,134. The number of looms increased from 30,144 in 1876 to 51,446 in 1892. In 1900 there were 785 manufacturing establishments, using a capital of $58,549,934, employing 32,780 persons, paying $11,739,129 in wages, and yielding products valued at $43,071,530. In 1900 a capital of $45,742,951 was employed in 46 cotton mills, producing over 500,000,000 yards (chiefly print cloths) per annum, calico print works with nearly 1,000 hands, 20 machines, and a productive capacity of 1,485,000 yards per annum; a woolen factory; spool and bobbin factory and bleachery. Next to cotton ranks dyeing and finishing textiles with a capital of nearly $7,000,000, and an output of $2,995,979. Mount Hope was the home of King Philip and the Namponoy Indians. The site of F. R. was settled 1659, became a part of the proprietary of Freetown, was set off and incorporated under its present name 1803, had its name changed to Troy 1804, and was so called till 1834, when it again assumed that of F. R., and received a city charter 1854. For a long time it was on the border line, and the subject of continual litigation between the states and people of Mass. and R. I., but the boundary question was settled and F. R. recognized as a possession of Mass. 1861. Pop. (1860) 14,026; (1870) 26,766; (1880) 48,961; (1900) 104,863.

FALMOUTH, *făl'mŭth:* parliamentary and municipal borough and seaport in the s.w. of Cornwall, on a w. branch of the estuary of the Fal. 14 m. n.n.e. of Lizard Point, 269 m. w.s.w. of London. It consists chiefly of a narrow street, a mile long, on the s.w. of the harbor, and of beautiful suburban terraces and villas on the heights behind. The harbor, one of the best in England, is formed by the estuary of the Fal, 5 by 1 to 2 m. in extent, 12 to 18 fathoms deep, and affording shelter to 500 vessels at a time. The mouth is defended on the w. by Pendennis Castle, on a rock 198 ft. high, and which resisted a siege by Cromwell for six months; on the e. by Mawes Castle—both built by Henry VIII. F. arose in the middle of the 17th c., Sir Walter Raleigh having at an earlier period drawn public notice to its capabilities; and it has since been a rendezvous for fleets and mail-packets proceeding abroad.—Pop. municipal borough (1891) 4,273, parliamentary borough, 18,072.

FALMOUTH: a town in Barnstable co., Mass.; on Vineyard Sound, Buzzards Bay, and on the New York, New Haven, and Hartford railroad, at the extreme w. end of Cape Cod; 50 m. n. w. of Boston. It is the center of a cranberry and agricultural region, but is best known as containing the Wood's Holl Station of the U. S. Fish Commission. Pop. (1890) 2,567; (1900) 3,500.

FALSE, a. *fawls* [OF. *fals*—from L. *falsus*, deceived: Ger. *falsch;* Icel. *falskr*, false: comp. Gael. *fallsa*, false: deceitful]: not true; not real or genuine; inaccurate; counterfeit; deceitful; treacherous: V. in *OE.*, to violate truth; to deceive; to feign. Fals'ing, imp. Falsed, pp. *fâlst*, deceived; falsified. False'ly, ad. *-lĭ*. False'ness, n. state of being false; double-dealing; treachery. False-attic, n. *-ăt'ĭk*, in *arch.*, attic without pilasters, casements, or balustrades, used for crowning a building, and bearing a bas-relief or inscription. False-bark, n. in *bot.*, layer on the outside of the stem of an exogen, which consists of cellular tissue with fibrous tissue entering it obliquely. False-bedding, n. in *geol.*, cross bedding in which the minor layers are not parallel to the principal ones. Prof. Sedgwick says that there are three distinct forms of structure exhibited in certain rocks throughout large districts: Stratification, Joints, and Slaty Cleavage. The first of these constitutes true bedding; the others may be classed together as false-bedding. Joints are natural fissures which often traverse rocks in straight and well-determined lines. Slaty cleavage, which is best seen in the clay, slate, and other metamorphic rocks, generally crosses the true planes of stratification at a high angle. The rock can be cleft into fissile layers parallel to the cleavage. False-blows, n. in *bot.*, the staminate flowers of the melon and cucumber; because they produce no fruit. False brome-grass, a name applied to *Brachypodium*, a genus of grasses consisting of about a dozen species, natives of temperate countries. Glumes very short and empty. False-core, n. in *foundries*, a part of a pattern which is used in the undercut part of a mold, and is not withdrawn with the main part of the pattern, but removed by a lateral draft subsequently. False-fifth, n. in *mus.*, a fifth altered from its perfect or major state. False-fire, n. in *naut.*, a blue flame, made by the burning of certain combustibles in a wooden tube, and used as a signal in the night, and for deceiving the enemy; called also blue flame. False-heart'ed, a. treacherous. False'hood, n. a lie; an untruth (see Fraud). False-keel, n. in *naut.*, a keel, generally of elm, and composed of several pieces. It is fitted under the main keel, to preserve it from friction, and to make the ship hold a better wind. In a ship that is not intended to be often in harbor, where it may ground, the false keel is slenderly secured, so that, if by accident the ship should ground, it may come off without damage. FALSE-NERVED, n. in *bot.*, applied to veins which have no vascular tissue, but are formed of simple elongated cellular tissue, as is the case in mosses, sea-weeds, etc. FALSE-PARSLEY, n. in *bot.*, *Æthusa Cynapium.* FALSE-RAIL, n. in *naut.*, thin piece of timber attached inside of a curved head-rail, in order to strengthen it; a facing or strengthening rail faced to a main rail. FALSE RELATION, n. in *mus.*, the occurrence of chromatic contradiction in different parts or voices, either simultaneously or in chords so near together that the effect of one has not passed before the other comes to contradict it with a new accidental. FALSE-ROOF, n. in *arch.*, open space between the ceiling of an upper apartment, and the rafters of the outer roof; a garret. FALSE-WORKS, n. in *civil eng.*, construction works for the erection of the main works. Coffer-dams, bridge-centring, scaffolding, etc., are false-works. FALSIFY, v. *fawl'sĭ-fī* [L. *făcĭō*, I make]: to make something appear true which is really false; to prove to be false; to forge; to violate the truth. FAL'SIFYING, imp. FAL'SIFIED, pp. *-fīd.* FAL'SIFIER, n. one who. FAL'SIFICA'TION, n. *-fĭ-kā'shŭn*, quality of being false; the act of making a thing appear what it is not. FAL'SITY, n. *-sĭ-tĭ*, an untruth from ignorance or mistake. FAL'SER, n. in *OE.*, a false or deceitful person.—SYN. of 'falsehood': falsity; fabrication; fiction; treachery; perfidy.

FALSE, RULE OF, or FALSE POSITION: mode of reckoning in cases where a direct solution of the question is impracticable. Any number is chosen at hazard, as that which is sought; this *false position* of course gives a false result, and from the amount of the error. it is ascertained by proportion what the assumption ought to have been. *Ex.* What number is that whose half exceeds its third by 12? Assume 96 at random; 48 — 32 gives 16, which is too great; ∴ 16 : 12 : : 96 : 72, the number required. This method is now mostly superseded by the use of equations.

FALSE AND PRETEND'ED PROPHE'CIES, with intent to disturb the public peace: punishable as crime under the common law in England by several old statutes, unrepealed, but no longer enforced.

FALSE BAY: inlet which may be referred either to the Atlantic, the Southern, or the Indian Ocean. It washes the e. side of the mountainous district of S. Africa, which terminates in the Cape of Good Hope, and extends e. along the coast as far as False Cape; about 22 m. in length, and about the same in breadth. F. B. is sheltered from the n.w. monsoon, to which Table Bay—the harbor of Cape Town—is supposed: this advantage is especially possessed by Simon's Bay, at its n.w. extremity. Hence, besides periodically receiving trading-vessels from Cape Town for temporary protection, it is permanently the station of the naval force of the colony.

FALSE IMPRIS'ONMENT: confinement or detention by another, without cause, or without legal cause. Every confinement of the person is an imprisonment, whether it be in a common prison or a private house, or in the stocks, or even by forcibly detaining one in the public streets (Coke, *Inst.* ii. 482). Thus, where a man gives another in charge for committing an offense, the former is liable to an action for false imprisonment, if he fails to substantiate his case. Police-officers, also, are liable for apprehending a man without a competent warrant, or without reasonable suspicion. But where a felony has been committed, an officer is entitled to arrest on suspicion. Not only constables but private persons may arrest a man who commits a felony in their presence. A person who has falsely imprisoned another is liable to a criminal prosecution, and also to a civil action. Any one detained without sufficient cause is entitled to apply for a writ of *Habeas Corpus* (q.v.) to procure his liberation. In Scotland, this species of offense is called Wrongous Imprisonment.

FALSE NEWS or RU'MORS: a crime under the common law of England. Spreading false news to make a discord between the sovereign and nobility, is a misdemeanor. The law before the Conquest had been more severe, and required that the author and spreader of false rumors should have his tongue cut out, if he redeemed it not by estimation of his head (or capitation tax). One of the articles against Cardinal Wolsey was founded on this principle of common law. 'Also the said cardinal has busied and endeavored himself by crafty and untrue tales against your nobles of your realm.'—Coke, *Inst.* iv. 92. The feeling of the present day is more in accordance with the axiom of Tacitus, *Convicia, si irasceris, tua divulgas, spreta excolescunt* (if you seek to revenge slanders, you publish them as your own; if you dispise them, they vanish).

FALSE PRETENSES, OBTAINING MONEY BY: one of various kinds of fraud. Under the English common law, mere fraud not amounting to felony, was not indictable unless it affected the public. Examples of fraud indictable at common law were—the use of false weights and measures; the sale of goods with counterfeit marks; playing with false dice; and frauds affecting the course of justice. Offenses like the first three named, known technically as 'cheats' derived their significance from the fact that they were perpetrated by means of false tokens or symbols. The use of such tokens brought them within the principle that the injury, to be indictable had to be of a public character. While many statutes prohibiting particular kinds of cheating in specified trades had been enacted from early times, the necessities of commerce made it apparent that unless the boundaries of the law respecting the offense generally were enlarged, many cases of grievous fraud would go unpunished. This extension of the law, so as to embrace the numerous varieties of verbal frauds, though gradually accomplished, proceeded very slowly. The first generally statute on the subject in England, namely, 33 Hen. VIII. chapter 1, enacted by the parliament of 1541–42, made frauds accomplished by means of false tokens and counterfeit letters practiced on individuals, misdemeanors. This statute is usually regarded as simply declaratory of the common law existing at the time. The statute did not apply to any *verbal* misrepresentations by means of which many frauds might be accomplished. The statute of 30 George II. chapter 24, was therefore passed by the parliament of 1757. This law directed 'that all persons who knowingly and designedly by false pretense or pretenses shall obtain from any person or persons money, goods, wares, or merchandises with intent to cheat or defraud any person or persons of the same, shall be deemed offenders against law and the public peace, and the court before whom such offenders shall be tried, shall on conviction, order them to be fined and imprisoned, or to be put in the pillory, or publicly whipped, or to be transported for seven years as the court shall think fit.' But new kinds of property, namely securities and choses in action, then slowly assuming a definite legal status under English law, were found unprotected by this and the preceding statute. A statute, 52 George III.. chapter 64, was therefore passed in 1812 to extend the law, to embrace bonds, bills of exchange, bank notes, all securities and orders for the payment of money, or the transfer of goods, or any valuable thing whatsoever. In 1827, on account of the subtle distinctions between larceny and fraud, under the law then existing, it was found necessary to pass another act, viz., 7 and 8 George IV., chapter 29, section 52, re-defining the offense, and providing that there should be no acquittal, notwithstanding that the case actually proved against one on trial for obtaining property under false pretenses, amounted to the technical offense of larceny. Finally the entire English law on the subject was codified by the statute 24 and 25 Victoria, chapter 96, sections 88 and 89, enacted in 1861, which provides for, and punishes every species of obtaining money or property by false pretenses.

In the United States, statutes, following the English, and based principally on 30 George II., chapter 24, heretofore noticed, have been generally enacted in the individual states. The effect of the American statutes has been to embrace the numerous varieties of obtaining money or property by false pretenses, not covered by the common law. It may be stated as a general proposition, under these American statutes, that it is indictable to obtain money or goods from individuals by *any* designedly false statements of facts likely, under the particular circumstances of the case, to deceive (Wharton, Crim. Law). Among others, the following false pretenses, followed by actually obtaining money or goods, have been held indictable in American law—that the party was a person of wealth and credit; that he was the owner of specific assets; that he had funds in the hands of a third party; pretending to have supernatural powers; to have delivered goods or to have been sent therefor; false personation of other persons; fictitious legal claims. False pretenses must however, be distinguished from mere 'puffing' or an exaggerated praise. The latter is not indictable unless specific assertions, actually false, are knowingly made. Obtaining property by giving checks which are known to the party to be worthless is a criminal false pretense, and this also applies to spurious money. It is not necessary, that a party, to make himself criminally liable, shall make use of false words. The false pretense may be implied from his conduct, or even from his silence when acquiescing in another's statements. The false pretense is not required to come from the indicted personally; he may be crimnally responsible, though the act were performed by an agent or confederate. It is, however, a fundamental rule, that the articles must have been obtained by means of the false pretense, though the latter is not required to be the sole motive for giving them up. To constitute the offense the *property* in the articles must be parted with by the party defrauded. If merely the *possession* be surrendered, the crime is not complete, though in such case a person may be guilty of larceny, if having obtained possession he subsequently takes the property.

FALSE RETURN', ACTION FOR: remedy against a false return made by a sheriff to a writ. When a sheriff makes a false return to a writ, the party injured may maintain an ac ion against him for damages. Thus, a return of *non est inventus* to a writ of *capias*, when the defendant might have been apprehended, or a return of *nulla bona* to a *fieri facias*, when there were goods which might have been seized, renders the sheriff liable in damages to the amount of loss occasioned by his negligence.

FALSE SIG'NALS: any false light or signal exhibited with intent to bring any ship or vessel into danger. The act is made felony, and the felonious intent may be proved by declarations made by the accused, or by circumstances which fairly lead to the conclusion of a guilty purpose.

FALSE SWEAR'ING: see PERJURY.

FALSETTO, n. *fâwl-sĕt'tō,* also FALSET [It.]: in *singing,* a strain on the voice above its natural compass; a feigned or false voice. The term is applied to the highest register of a man's voice, which joins the natural or chest voice, and which by practice may be so blended with the chest-voice as to make no perceivable break.

FALSE VER'DICT: verdict by a jury against the evidence. The remedy in cases where it was alleged that a false verdict had been returned, was formerly in England by means of a writ of attaint; but this only in cases where the jury had returned a verdict on their own knowledge of the facts, and the writ proceeded on the assumption that, in returning a false verdict, they were necessarily perjured. Writ of attaint was abolished under George IV.—The universal rule now is, that though in most civil cases a new trial may be had for various causes, in no case can jurymen be punished, though finding a verdict against evidence.

FALSE WEIGHTS AND MEA'SURES: fraudulent devices in trade, whose use is an offense at common law.

FALSI CRIMEN, phrase, *făl'sī krī'mĕn* [L. the crime or charge of what is false or fraudulent]: in *law*, fraudulent subornation or concealment, allied to forgery.

FALSIFY, FALSIFICATION, etc.: see under False.

FAL'SIFYING REC'ORDS: obliterating, injuring, or destroying any record, writ, etc., or any original document belonging to any court of justice. It is a serious crime severely punishable, as is the crime also of any person employed to furnish certified copies wilfully certifying any document as a true copy, knowing the same is not so. Similar is the crime of any person employed in a public record office certifying any writing to be a true copy, knowing the same to be false in any material part.

FALSTER, *fâl'stėr:* Danish island in the Baltic, s. of Seeland, lat. 54° 30′—54° 58′ n., and long. 11° 45′—12° 11′ e. It is separated by the strait called the Grönsund from the island of Moen, and by that called the Guldborgsund from the island of Laaland, together with which F. forms the stift or province of Laaland, a province with 635 sq. m., and about 200,000 inhabitants. F. is about 26 m. long, and 16 wide at its widest part, and has about 178 sq. m. It is flat, remarkably fruitful, and well cultivated, so that it resembles an attractive garden. The inhabitants are employed chiefly in agriculture and cattle-breeding. The chief town is Nykjöbing, on the Guldborgsund. It is very old, has a castle and a cathedral, has some commerce and shipbuilding, and a pop. about 4,000. The only other place of any note is Stubbekjöbing.—Pop. of the island of F., abt. 28,000.

FALTER, v. *fawl'tėr* [OF. *falter*, to fail: Norw. *haltra*, to limp: Sp. *faltar*, to fail, to falter—connected with Fault: comp. Gael. *fealltair*, a perfidious person]: to hesitate in speaking; to speak with broken or trembling tones; to be unsteady or feeble; to hesitate in purpose. Fal'tering, imp.: Adj. hesitating. Fal'tered, pp. *-tėrd*. Fal'teringly, ad. *-tėr-ĭng-lĭ*.

FALTER, v. *fawl'tėr* [Gael. *falt*, the hair of the head]: in *OE.*, to thrash barley in the chaff; to cleanse barley. Faltered, pp. *fawl'tėrd*, having hair disordered; dishevelled.

FALUN, or Fahlun, *fâ'lôn* (called also *Gamla Kopparberget*, 'old copper-mine'): town of Sweden, cap. of the län, or province, of the same name. It has long been famous for its copper-mines, though the quantity of ore now obtained is much smaller than formerly. In 1650, the yield was 3,000 tons annually; this declined, in 1690, to 1,900 tons; while at present it is only about 400 tons. Gustavus Adolphus called the mines the 'treasury of Sweden.' The excavations extend for miles underground, containing vast chambers, where Bernadotte, the late king, gave splendid banquets, on which occasions the mines were brilliantly lighted. F. is regularly built, and its houses are of wood, and blackened by the fumes of the numerous smelting-furnaces. Pop. (1891) 8,085.

FALUNS, *fâ'lŭnz:* term given by the agriculturists of Touraine to shelly sand and marl, which they use as manure. The term is applied by geologists to the formations from which they are obtained. They are loosely aggregated beds of sand and marl, but occasionally so compacted by calcareous cement as to form a soft building-stone. The animal remains in them are chiefly marine, and of a more tropical fauna than that of the Mediterranean. A few land and fluviatile mollusca are found mixed with the oceanic forms, and with these are associated the remains of terrestrial quadrupeds, as Dinotherium (q.v.), Mastodon (q.v.), Rhinoceros (q.v.), etc.

FALX, n. *fălks* [L. a sickle, a scythe]: in *anat.*, anything shaped like a sickle or scythe.

FAMA, *fā'ma* [Gr. *Pheme*]: in *classical myth.*, the goddess of rumor. She appears in the works of the earliest poets. Sophocles makes her the child of Hope; Virgil, the youngest daughter of Terra, the sister of Enceladus and Cœus.

FAMA CLAMOSA, *fā'ma kla-mō'sa,* in the Ecclesiastical Law of Scotland: wide-spread report, imputing immoral conduct to a clergyman, probationer, or elder of the church. A F. C., if very clamant, may form the ground of process by a presbytery, without any specific complaint being brought before them, or there being any particular accuser. In these circumstances, the presbytery act for the vindication of their own order, and in behalf of the morals of the community. Should the inquiries of the presbytery lead them to the conviction that the rumor is not without foundation, they will serve the accused party with a libel, and thus bring him for trial before them. (Hill's *Church Prac.* 49; Cook's *Styles;* and Wood *On Libels*).

FAMAGOSTA, *fâ-mâ-gŏs'tâ,* or Famagusta, *fâ-mâ-gôs'tâ:* seaport on the e. coast of Cyprus (q.v.); on the supposed site of ancient Arsinoë, about 35 m. from Lefkosia (q.v.), present cap. of the island. It was a place of importance in the crusades, and under the Venetians 1489—1571 it became rich and flourishing, with a pop. of fully 30,000 inhabitants; now only a few hundreds find shelter among the filthy ruins, the wreck of its churches and palaces. On coming under the sway of the Turks after a siege of four months, it fell into a state of decay; an earthquake 1735 completed its ruin. The town is inclosed within well-built walls, constructed from the ruins of Salamis; but of its 300 churches, only one, that of St. Nicolas, remains. It is now used as a mosque, but contains many monuments of its former use, and is a fine specimen of mediæval architecture; in it Richard I. of England crowned Guy de Lusignan king of Cyprus, 1191. F. possesses a good natural harbor, about 8,000 ft. long, by 2,000 ft. wide, which would require to be dredged before it could admit ships of the largest tonnage. The water in the bay exceeds 170 fathoms in depth. Under Turkish rule F. was simply regarded as merely a military fortress and occupied by the sultan's troops; since Cyprus became a British possession, the affairs of the town and province have been administered by a resident civil commissioner and his assistant, with numerous native officials. About five m. n. are the ruins of ancient Salamis. Chief exports of F. are corn and pomegranates, for which the district is famous.

FAME, n. *fām* [F. *fame*—from L. *fāma*, rumor, fame: Gr. *phēmē;* It. *fama*, rumor, fame: comp. Gael. *fuaim*, sound, noise]: renown; rumor; public report, good or bad. Famed, a. *fāmd*, renowned; much talked of. Fame'less, a. without renown. Famous, a. *fā'mŭs*, much talked of and praised; renowned. Fa'mously, ad. *-lĭ*, with great renown; in a manner highly gratifying, as, he is getting on *famously*. Fa'mousness, n. great fame; celebrity.—Syn. of 'fame': reputation; repute; notoriety; credit; honor;—of 'famous': celebrated; remarkable; noted; signal; conspicuous; illustrious; eminent; transcendent; distinguished; excellent.

FAMILIAR, a. *fă-mĭl'yėr* [F. *famille*, a family—from L. *famĭlĭă*, a family or household: It. *famiglia:* comp. Skr. *dhāman*, an abode, a house]: well acquainted with; well known; intimate; affable; easy and unconstrained; common; frequent: N. one long acquainted; a spirit or demon supposed to wait on; an officer or servant of the Inquisition (q.v.) employed to arrest and imprison the accused. Famil'iarly, ad. *-lĭ*. Famil'iar'ity, n. *ĭ-ăr'ĭ-tĭ* [F. *familiarité*]: freedom from ceremony; affability; intimacy; fellowship. Famil'iarize, v. *-yėr-īz*, to make intimate or familiar; to make easy by practice or by intercourse. Famil'iarizing, imp. Famil'iarized, pp. *-īzd*. Family, n. *făm'ĭ-lĭ*, a household; descendants from one common progenitor; race; lineage; in *nat. hist. classifications*, the group next in comprehensiveness above a *genus* (see Order, in Natural History); kind, tribe, or group. Family of Love: see Agapemone.

FAMIL'IAR SPIR'ITS: supernatural beings, spirit slaves, deemed to be in attendance upon magicians, wizards, witches, conjurors, and other skilful professors of the black art. The word 'familiar' is in all likelihood derived from the Latin *famulus* (a 'domestic,'. a 'slave'). The belief in such spirits goes for back into the history of the race. We read of them in the time of Moses, who admonishes his countrymen.—'Turn ye not unto them that have familiar spirits' (Lev. xix. 31), which would imply the prevalence of the belief among the Jews and Egyptians. The word in the original rendered 'familiar spirits' is *oboth*; it is of frequent occurrence in the Hebrew Scriptures, and literally signifies 'leathern bottles;' thereby indicating the antiquity of the idea, that magicians were wont to imprison in bottles the spirits whom their spells had subdued (whence our 'bottle imps' and 'bottle-conjurors'); cognate with which grotesque belief is perhaps the fact that mystical liquids kept in vials have been immensely in vogue among conjurors of all ages and countries. It is not clear, as some think, that we can include Socrates among those who deemed themselves to have a familar spirit; for though he spoke of his attendant 'dæmon' in ambiguous terms, the opinion of all enlightened critics is, that he meant by the word that which Christians mean by the presence of a divine light and guide in the heart and conscience. But according to Delrio—a great authority on this subject—the belief in familiar spirits in the grosser and more magical form did exist among the ancient Greeks; who, he affirms, designated such beings *Paredrii*, 'companions,' as being ever assiduously at hand. The story of the ring of Gyges, king of Lydia, narrated by Herodotus, is held by Heywood (see *Hierarchie of the Blessed Angels*, etc.) to prove the existence of the belief in that country also; and it is quite certain that during the middle ages the belief in 'enchanted rings' containing familiar spirits was widely diffused throughout Europe, the magicians of Salamanca, of Toledo, and of Italy, being especially famous for their skill in thus subjugating and imprisoning demons. Asia seems the original home of this belief, which has long been established as a cardinal superstition of the Persians and Hindus, and which appears in perfection in the *Arabian Nights*. The 'slave of the lamp' who waits upon Aladdin is an example in point. Whether the belief in spirit slaves sprang up independently among the nations of w. Europe, or was transplanted thither by intercourse whit the East, is not known. A favorite form assumed by the familiar spirit was that of a black dog. Jovius and others relate, that the famous Cornelius Agrippa (q.v.), half philosopher, half quack, was always accompanied by 'a devil in the shape of a black dog;' and add, that when he perceived the approach of death, he took a collar ornamented with nails, disposed in magical inscriptions, from the neck of this animal, and dismissed him with these memorable words: *Abi, perdita Bestia, quæ me totum perdidisti*—('Away, accursed beast, who has ruined me wholly for ever'). Butler, in his *Hudibras*, speaks highly of this animal:

> Agrippa kept a Stygian pug
> I' the garb and habit of a dog
> That was his tutor, and the cur
> Read to the occult philosopher,
> And taught him subtly to maintain
> All other sciences are vain.

The readers of Goethe, too, will remember that Mephistopheles appears first in this shape to Faust and Wagner during their evening walk; but, in truth, the earliest instances of such transmigration are much older at least, if mediæval tradition can be credited, for it assures us that Simon Magus and other ancient magicians had familiar spriits who attended them in the form of dogs. In spite of the servitude to which the attendant imps were reduced by the potent spells of the magicians, they were popularly supposed, during the middle ages, to have their revenge at last, by carrying with them into eternal torment the souls of their deceased masters. This idea of divine retribution overtaking the practicers of magic is, however, not found outside of Christendom. The Jews think not the less but the more of Solomon because he was, as they say, one of the greatest of magicians; and a similar feeling in regard to 'wonder-workers' pervades eastern nations generally, though it is to be noticed that the latter are often represented as using their power malignantly: see MAGIC. Modern spiritism in some of its phases shows the tenacity of this belief in the human mind, without which it could have no basis for its amazing structures of fraud; see SPIRITISM.

FAMILIST, n. *făm'ĭ-lĭst* [L. *familia;* Eng. *-ĭst*]: in *chh. hist.*, a sect which arose in Holland about the middle of the sixteenth c., and taught that the essence of religion consisted in the feelings of divine love, hence they were otherwise called the Family of Love, though entirely distinct from the Agapemone (q.v.). Some familists were fanatical perfectionists; others were grossly immoral.

FAM'ILY: household; having at least its usual nucleus, though not usually its limits, in a common lineage. Though we are in the habit, doubtless with reason, of regarding the life of antiquity, and particularly of Greece, as less domestic than that of Christian Europe, the idea of the family or house [Gr. *oikós*], as the nucleus of society, as the political unit, was there very early developed. Aristotle speaks of it as the foundation of the state, and quotes Hesiod to the effect that the original family consisted of the wife and the laboring ox, which held, as he says, to the poor the position of the slave (*Polit.* i. 1). The complete Greek family then consisted of the men and his wife and his slave; the two latter, Aristotle says, never having been confounded in the same class by the Greeks, as by the barbarians (*Ib.*). In this form, the family was recognized as the model of the monarchy, the earliest, as well as simplest, form of government. When, by the birth and growth of children, and the death of the father, the original family is broken up into several, the heads of which stand to each other in a co-ordinate rather than a strictly subordinate position, we have in these the prototypes of the more advanced forms of government. Each brother by becoming the head of a separate family, becomes a member of an aristocracy, or the embodiment of a portion of the sovereign power, as it exists in the separate elements of which a constitutional or a democratic government is composed.

But at Rome the idea of the family was still more closely entwined with that of life in the state, and the natural power of the father was taken as the basis not only of the whole political, but of the whole social organization of the people. For the Roman idea of the family in its more special aspects: see PATRIA POTESTAS. Here it suffices to state that with the Romans, as with the Greeks, it included the slave as well as the wife, and ultimately the children; a fact which indeed is indicated by the etymology of the word, which belongs to the same root as *famulus*, a slave. In its widest sense, the *familia* included even the inanimate possessions of the citizen, who, as the head of a house, was his own master (*sui juris*); and Gaius (ii. 102) uses it as synonymous with *patrimonium*. In general, however, it was confined to persons—the wife, children, grandchildren, and great-grandchildren, if such there were, and slaves of a full-blown Roman citizen. Sometimes, too, it signified all those who had sprang from a common stock, and would have been members of the family, and under the potestas of a common ancestor, had he been alive: see AGNATE. In this sense, of course, the slaves belonging to the different members of the family were not included in it. It was a family, in short, in the sense in which we speak of 'the royal family,' etc., with this difference, that it was possible for an individual to quit it, and to pass into another by adoption: see ADOPTION. Sometimes, again, the word was used with reference to slaves exclusively, and, analogically, to a sect of philosophers, or a body of gladiators. See Smith's *Dictionary of Greek and Roman Antiquities.*

The whole social fabric is based on the grouping of human beings in familes; an arrangement in harmony with all the conditions and wants of human life, and which tends to foster habits and affections essential to the welfare of mankind. A prosperous community must be an aggregate of happy families; there being little true happiness in the world that is not intimately connected with domestic life. The formal bond of the family is marriage (q.v.; see also POLYGAMY); and an essential condition of its right development seems to be a distinct abode, which shall be not a mere shelter, but a house or *home,* affording a certain measure of comfort and decency, according to the standard prevalent in the community. According to the views of some modern anthropologists, the family is historically posterior and not prior to the tribe. See MARRIAGE, and the books there named.

FAMINE, n. *făm'ĭn* [F. *famine*—from mid. L. *famĭnă*—from L. *fămēs*, hunger: It. *fame;* F. *faim*, hunger: comp. Gael. *feum*, to be in want]: scarcity of food; want; destitution. FAM'ISH, v. *-ĭsh*, to starve; to suffer from want. FAM'ISHING, imp.: ADJ. starving; perishing for want of food. FAM'ISHED, pp. *-ĭsht.* FAM'ISHMENT, n. state of extreme want. FAMINE-FEVER, n. in *med.*, typhus fever; relapsing fever.

FAMINE: in general a period of suffering produced by scarcity of food. Famines have occurred in all parts of the world and from remote ages. Extended lists have been made of the most distressing ones with more or less particularity of detail, and scientists have presented thoughtful speculations upon their causes. Among the avoidable causes are enumerated war, defective agriculture, deficient transportation, legislative interference, currency restrictions, speculation in food products, and misapplication of grain; and among natural causes are excessive rain, frost, drought, earthquakes, hurricanes, hail-storms, and plagues of vermin, insects, worms, rats, and rabbits. How many human beings perished in the famines of which some records have been preserved cannot be computed, but the number must have extended into hundreds of millions, since it is known that those in India alone have carried off more than 30,000,000 within little more than a century. The increase of railroads and other means of intercommunication has not lessened the occurrence of famines to the extent anticipated, though it has had the effect of immeasurably ameliorating the suffering in stricken localities by hastening the means of relief. As far back as B.C. 1708 Egypt was visited by a 7 years' F., during which millions of people and animals perished. In B.C. 436 thousands of people threw themselves into the Tiber at Rome to escape terrors of starvation, and other thousands starved outright. Egypt again suffered A.D. 42, and Rome 262, when the horrors of a plague were added to the affliction of a F. In 272 Great Britain was visited by such a severe F., that the people were forced to eat the bark of trees; in 306 both F. and plague spread over Scotland, carrying off thousands; 4 years later, England lost 40,000 people from the same causes; and in 325 all of Great Britain suffered from a F. Phrygia experienced its terrors 370, Constantinople 446, and Italy, where parents were reduced to the awful extremity of eating their own children, 450. Scotland had another visitation 576, and the British isles then had a respite till 739, when England, Wales, and Scotland were plunged into a common distress, which was repeated 823 and 954–9, while England was an isolated sufferer 974, 976, 1005. Since 1000, India has suffered most from F., and Great Britain next. It will be interesting to note the years of the most severe visitations in the former country, as they cover much of the period of modern administration, refute the old claim that the opening of railroads and post roads would decrease the occurrence of F., and show that these ameliorating agencies are powerless against the natural causes already enumerated. In 1771 Bengal was devastated; 1837

-8 over 800,000 perished in the N. W. Provinces; 1860–1 the same region suffered nearly as severely; 1865–6 about 1,000,000 died in Bengal and Orissa; 1868–9 about 1,500,000 in Rajpootana and vicinity; 1874 a F. occasioned by drought carried off thousands more in Bengal; 1877 about 500,000 died in Bombay, Madras, Mysore, and adjoining agencies, and the govt. determined to lay aside $7,500,000 annually for provision against future famines, the same to be known as the F. insurance fund and to be used in construction of protective works such as railroads and canals, 1880. Subequent to 1005 England suffered in the general F. that scourged nearly the whole of Europe 1016. and in 1087, 1193–95 (when a pestilential fever accompanied it), 1251, 1315 (when the people were forced to eat even the most loathsome animals), 1335 (caused by long rain), 1353, 1748 (through the whole realm), 1795 and 1801 (also through the realm). Ireland suffered independently, chiefly in consequence of the failure of the potato crop, 1814, 16, 22, 31, 46, 47, and 80. At the last period the U. S. govt. sent a war vessel thither with food, of which James Gordon Bennett, Levi P. Morton, and William R. Grace contributed each a fourth part of the entire cargo. France shared with England the distress of 1193–95, 1353, and was isolated 1693, 1789. The n. provinces of China were devastated 1876–79; Brazil had its first serious F. 1878; Egypt was visited 1879; Persia lost many thousands 1871–72, 1880; Cape Verde, Africa, lost 16,000, 1775; Iceland had a F. caused by the unusually severe polar winter, 1881–2, which rendered agriculture impossible in most parts, and the distress of the people was aggravated by epidemics of small-pox and measles; the w. Highlands of Scotland, the Hebrides Islands, and the coast of Ross-shire suffered extreme destitution from the entire failure of the potato crop and herring-fishery and the destruction of the grain crops by hurricanes 1882; Upper Silesia experienced its greatest destitution from an overflow of the Oder river 1880; suffering from scarcity of food and freezing of winter wheat prevailed in many parts of European Turkey and especially in Armenia through 1880, and led to wide-spread rioting; and a severe drought produced a F. in Anatolia and the vilayets of Broussa, Angora, Konieh, Adana, Smyrna, and Sevas, Asia Minor, in the summer of 1887.

In 1891-2 a F. affected 27,000,000 people in 18 provinces of Russia; 1900, 30,000,000 suffered and more than 1,000,000 died in the central and southern portions of India. 1902-3 a large portion of the population of Finland suffered; and 1903, June, it was officially reported that over 1,000,000 natives in Kwang Si province, China, were starving. In all of these cases the citizens of the United States contributed liberally to aid the sufferers.

FAMOUS: see under **Fame**. **Famoused**, a. *fā'mŭs-ĕd,* less correctly *fā'mŭst,* in *OE.*, rendered famous; renowned.

FAMULUS, n. *făm'ū-lŭs* [L. *famŭlŭs,* a servant, an attendant]: the familiar spirit of a magician; any doer of hard or dirty work under a superior.

FAN, n. *făn* [Ger. *wanne;* L. *vannus*, a winnowing fan: Gael. *fannan*, a gentle breeze]: a light broad frame used to cool the face by agitating the air with it; anything in the shape of a fan; an instrument for producing artificial currents of air by the revolving of two or more broad blades, used for winnowing grain (see FANNERS): V. to cool and refresh by moving the air; to winnow, as grain; to increase the heat or flame of, as by fanners. FAN'NING, imp. FANNED, pp. *fănd.* FAN'NER, n. he or that which fans. FAN'NERS, n. plu. the blowers of a winnowing machine or furnace (see below). FAN-CORAL, n. in *zool.*, name of the genus *Rhipidogorgia*, belonging to the family *Gorgonidæ.* FAN-CRICKET: see MOLE-CRICKET. FAN-FOOT, n. in *entom.*, a name given to the genus of moths *Polypogon;* in *zool.*, *Ptyodactylus Gecko*, species of lizard, a native of northern Africa, reputed to be exceedingly venomous. The toes form at the extremities round disks (whence the name *Fan-foot*), enabling the animal to climb up walls; the claws are retractile. The venom is said not to be injected by the teeth, but to be exuded from the lobules of the toes, whence the scientific name Ptyodactylus, from Gr. *ptuo*, to split, and *daktulos*, a finger or toe. FAN-LIGHT, a fan-shaped window, generally over a door. FAN-TRACERY, *-trā'sėr-ĭ*, carved work in Gothic architecture diverging like the folds of a fan. FAN-TAIL, tail of a bird capable of being spread out like a fan; a kind of pigeon. FAN-TAIL WARBLER, n. in *ornith.*, *Cisticola cursitans*, a very tiny bird, somewhat like a diminutive lark; native of southern Europe, Africa, India, and China. It is remarkable for its very neat and beautiful nest.

FAN: instrument for moving the air for the sake of coolness, or for winnowing chaff from grain. In the East, the use of fans for personal comfort is of remote antiquity. The Hebrews, Egyptians, Chinese, and the miscellaneous population of India, all used fans as far back as history reaches. At the present day, it is customary, in the better classes of houses in India, to suspend a large of fan from the ceiling, and keep it in agitation with strings, pulled by servants, in order to give a degree of coolness to the air: see PUNKAH. Among the oldest notices of winnowing fans are those in the Scriptures. There the fan is always spoken of as an instrument for driving away chaff or for cleansing in a metaphorical sense; and such notices remind us of the simple processes of husbandry employed by a people little advanced in the arts. It was a long stride from the use of a simple hand-instrument for winnowing to that of the modern mechanism employed for a similar purpose: see FANNERS: BLOWING MACHINES.

As is observable from the collection of Egyptian antiquities in the British Museum, the fan is a very ancient article of female taste and luxury. Terence, writer of Latin comedies, B.C. 2d c., makes one of his characters speak of the fan as used by ladies in ancient Rome: *Cape hoc flabellum, et ventulum huic facito*—'Take this fan, and give her thus a little air.' From this Roman origin, the fashion of carrying fans could scarcely fail to be handed down to the ladies of Italy, Spain, and France, whence it was in advanced times brought into Great Britain. Queen Elizabeth, when in full dress, carried a fan. Shakspeare speaks of fans as connected with a lady's 'bravery' or finery:

> With scarfs and fans, and double charge of bravery.

In these and later times the fan was not a mere article of finery. There were walking as well as dress fans. The walking or outdoor fan which a lady carried with her to church, or to public promenades, was of large dimensions, sufficient to screen the face from the sun, and answered the purpose of the modern parasol (q.v.). In old prints, ladies are seen carrying these fans in different attitudes. The dress fan, which formed part of a lady's equipment at court ceremonies, drums, routs, and theatrical entertainments, was of a size considerably less than the walking fan, and altogether more elegant. Of these dress fans there remain numerous specimens bequeathed as heirlooms from one generation to another. All were probably of French manufacture. The more costly fan imported from China was and still is altogether of ivory, higly carved and pierced; but it lacks the lightness and flexibility essential in this article, which was used less for cooling than for giving the hands something to do, and for symbolically expressing certain passing feelings. In the hand of an adept, the fan, by peculiar movements, could be made to express love, disdain, modesty, hope, anger, and other emotions. Gay, speaking of Flavia's accomplishments, says:

> In other hands, the fan would prove
> An engine of small force in love.

Considering the coarseness of language, even in the higher circles, in the early part of the 18th c., we cannot wonder that the fan should have been indispensable to a lady in company. It was held up to shield the countenance when anything shocking was uttered. Pope has an allusion to this use of the fan—

> The modest fan was lifted up no more,
> And virgins smiled at what they blushed before.

Steele in a paper in the *Tatler*, No. 52, 1709, Aug. 9, gives an amusing account of Delamira, a fine lady, resigning her fan when she was about to be married. One of her female acquaintances, having envied the manner in which this charming and fortunate coquette had played her fan, ask(her for it. Delamira acknowledges the wonderful virtues of the fan, and tells her that 'all she had above the rest of her sex and contemporary beauties was wholly owing to a fan (that was left her by her mother, and had been long in the family), which, whoever had in possession, and used with skill, should command the hearts of all her beholders; "and since," said she smiling, "I have no more to do with extending my conquests or triumphs, I will make you a present of this inestimable rarity."' Two years later, Addison, in a paper in the *Spectator* (No. 102), gives a humorous accout of the tactics of coquettes in the use of fans, 'Women are armed with fans as men with swords, and sometimes do more execution with them;' then he goes on to describe how ladies are instructed to handle, discharge, ground, and flutter their fans—the whole being a pleasant satire on the fan-maneuvering in the reign of Queen Anne.

Later, in the 18th c., fans served another important purpose. At dancing assemblies in London, Bath, and elsewhere, it was usual for the gentlemen to select their partners by drawing a fan. All the ladies' fans being placed promiscuously in a hat, each gentleman drew one, and the lady to whom it belonged was his allotted partner. Mrs. Montagu, in one of her letters, refers to this custom: 'In the afternoon, I went to Lord Oxford's ball at Mary-le-bone. It was very agreeable. The partners were chosen by their fans, but with a little *supercherie.*' Of the trick or fraud which this authoress delicately veils under a French term, the beaux of that period were far from guiltless. A lady's fan was almost as well known as her face, and it was not difficult, with a little connivance, to know which to draw. At Edinburgh, where it appears to have been the practice to select a partner for a whole season, the fans of the ladies were carefully studied. Sir Alexander Boswell alludes to this species of stratagem in one of his poems:

> Each lady's fan a chosen Damon bore,
> With care selected many a day before;
> For unprovided with a favorite beau,
> The nymph, chagrined, the ball must needs forego.

In Spain, the old fashion of fan-flirting appears to be still in vogue. A traveller in that country says: 'I was vastly interested in the movements of the ladies' fans at church. All the world knows that Spanish fans are in perpetual motion, and betray each feeling, real or assumed, that passes through the mind of the bearer."—*Vacation Tourists,* 1861. See *The Fan* by Uzanne (transl. 1883).

FANAL, n. *fa-nâl'* [F.—from Gr. *phanos,* lamp—from *phainō,* I show, I shine forth]: a light-house; or, more correctly speaking; the apparatus in the light-house for giving light.

FANAM, n. *făn'ăm:* money of account formerly used in Madras; value about 3½ cents; copper coin of Ceylon worth about 3 cents.

FANARIOTS, *fan-âr'ĭ-ots:* general name given to the Greeks inhabiting the Fanar or Fanal in Constantinople, a quarter of the city which takes its name from the beacon (Gr. *phanarion*) in it. They first appear in history after the taking of Constantinople by the Turks, and appear to have been originally descendants of such noble Byzantine families as escaped the fury of the barbarians. Afterward, however, the class was recruited by emigrants from different parts of the old Byzantine empire. Subtle, insinuating, intriguing, they soon took advantage of the ignorance of the Turkish governors, and made themselves politically indispensable to their rulers. They filled the offices of dragomans, secretaries, bankers, etc. One of them, named Panayotaki, at a later period, was appointed Dragoman to the Divan, and his successors obtained still greater honors. Through their influence, the lucrative office of Dragoman of the Fleet was called into existence, which gave them almost unlimited power in the islands of the Archipelago. Besides, from them were chosen, until the outbreak of the revolution 1822, the Hospodars of Wallachia and Moldavia, while, in addition, the disposal of most of the civil and military posts under the Turkish govt. was in their hands. In spite of their power, however, the F. never showed much patriotism; they were animated by the petty motives of a caste, and when the war of liberation broke out among their countrymen, they took no part in it. In the present altered state of affairs in Turkey, they have no political influence. See Marco Zalloni's *Essai sur les Fanariots* (Marseille, 1824; 2d ed. 1830); also Finlay's *History of the Greek Revolution* (Edin., Blackwood and Sons 1861).

FANATIC, a. *fă năt′ĭk*, or FANAT′ICAL, a. *-ĭ kăl* [F. *fanatique*, fanatic—from L. *fanatĭcus*, inspired by a divinity, frantic—from *fānŭm*, a temple: It. *fanatico*]: extravagant and excessive in opinions, generally religious opinions: N. a person possessed of mild notions or opinions; an enthusiast. FANAT′ICALLY, ad. *-lĭ*. FANAT′ICISM, n. *-sĭzm*, wild and extravagant notions in religious subjects.—SYN. of 'fanatic, n.': visionary; zealot; bigot;—of 'fanaticism': enthusiasm; frenzy; superstition.

FANCY, n. *făn′sĭ* [F. *fantasie*, the fancy—from mid. L. *fantāsĭă*—from Gr. *phantasĭă*, a making visible, imagination—from *phaino*, I appear]: an image or representation formed in the mind at pleasure, but not always connected with reason or practicability; a notion; a liking; a conceit or whim (see IMAGINATION): ADJ. elegant; ornamental: V. to figure to one's self; to imagine; to like; to be pleased with. FAN′CYING, imp. FAN′CIED, pp. *-sĭd:* ADJ. imagined; imaginary; liked. FAN′CIER, n. *-sĭ-ĕr*, one who fancies or has a strong liking for, as a *dog-fancier*. FAN′CIFUL, a. *-fûl*, guided by the imagination rather than by reason or experience; full of wild images; visionary; whimsical. FAN′CIFULLY, ad. *-lĭ*. FAN′CIFULNESS, n. THE FANCY [a slang term]: the whole body of sporting characters, generally applied to the prize-ring. FANCY-BALL, one at which fancy dresses, in various characters, are worn. FANCY-FREE, free from the power of love. FANCY MONGER [see MONGER]: in *OE.*, one given to wild conceits and whims through love. FANCY-SICK, one with an unsound or distempered mind.—SYN. of 'fancy, n.': conceit; imagination; humor; taste, inclination; conception; caprice; impression;—of 'fanciful': ideal; capricious; imaginative; fantastic; wild; chimerical.

FANDANGO, n. *făn-dăn′gō* [Sp.]: like the *Bolero*, an old Spanish national dance, in $\frac{3}{4}$ time. It is danced most gracefully in the country districts, usually to the accompaniment of a guitar, while the dancers beat time with castanets, a custom borrowed from the Moors. It proceeds gradually from a slow and uniform to the liveliest motion; and notwithstanding the simplicity of the *pas*, vividly ex-presses all the graduations of the passion of love, in a manner sometimes bordering on licentiousness. The people are so passionately fond of it, that the efforts of the clergy have never been able to suppress it.

FANE, n. *fān* [L. *fānum*, a temple—from *fārī*, to speak, to utter in prophecy]: a church; a temple.

FANE, n. *fān* [Icel. *fáni*, a flag: Gael. *fannan*, a gentle breeze: L. *vannus;* Ger. *wanne*, a winnowing fan: Ger. *wannen*. to winnow; *fahne*, a vane]: in *old* and *prov. Eng.*, anything on an elevation free to be moved by the wind like a flag, to show which way the wind blew; a weathercock—formerly made in various shapes, but seldom that of a cock; in *OE.*, a banner. *Note.*—VANE is the word now used for FANE.

FANEUIL HALL, *făn'ĕl*, popularly, *fŭn'ĕl:* spacious public hall in Boston, erected 1742 by Peter Faneuil, and presented by him to the town. Peter Faneuil (1700–43) was of French-Huguenot descent; b. New York, and removed to Boston, where he amassed wealth in mercantile life. In its original condition, the building when completed and presented, contained a hall for public meetings, with smaller apartments above, and a basement used as a market. In 1761, it was destroyed by fire, and rebuilt. During the revolutionary struggle with England, the hall was so often used for important political meetings, that it became known as 'the cradle of American liberty.' In 1805, the building was increased in height by an additional story, and also increased in width. It is now about 80 ft. square. The hall contains some fine paintings; and the basement is no longer used as a market.

FANFARE, n. *făn'fâr* [F. *fanfare*, the sound of a trumpet: Gael. *fonn-fair*, the music of awakening, the reveille—from *fonn*, music, a tune; *fair*, the break of day]: a flourish of trumpets; short and lively military air or call, executed on brass instruments. It was brought by the Arabs into Spain, whence it passed into Mexico and the new world. **FANFARON**, n. *făn'fă-rŏn* [F.]: one who blows the trumpet of his own praises; a bully; a swaggerer; a boaster who 'blows his own trumpet.' **FANFAR'ONADE'**, n. *-nād'*, blustering talk; swaggering; empty noise.

FANG, n. *făng* [AS. *fang*, a taking, a grasp: Ger. *fangen*, to catch: Dut. *vangen;* Goth. *fahan*, to catch]: a pointed tooth; a tusk; a claw or talon; in *OE.*, a sheriff's officer. V. in *OE.*, to seize with fangs; to clutch. **FANGED**, a. *făngd*, having fangs. **FANG'LESS**, a. having no fangs. **INTO HIS FANGS**, into his clutches or power. **TAKEN WITH THE FANG**, in *Scottish law*, a thief apprehended while carrying the stolen goods on his person. It is not very long since this word formed part of the common speech of Scotland:

> 'Snap went the shears, then in a wink,
> The *fang* was stowed behind a bink.'
>
> *Morison's Poems*, p. 110.

In England, also, the verb *fang* was still in use in Shakespeare's time: 'Destruction *fang* mankind!' (*Timon of*

Athens, iv. 3); and 'Master Fang,' in *Henry IV.*, is named after his office.

FANGLED, a. *făng'gld* [AS. *ficol*, fickle: Ger. *ficken*, to move lightly to and fro: comp. Gael. *faoinealach*, silly, foolish]: begun; newly made. FANGLE, n. *făng'gl*, a trifle; a vain thing; a newly-fashioned trifle. NEW-FAN'GLED, a. inconstant; changeable; given to novelty.

FANION, n. *făn'yŭn* [F.]: a small flag carried with the baggage of an army.

FANK, n. *fănk* [Scot.]: a sheep cote or pen; a coil of rope: V. to put a sheep in a fold; to coil a rope. FANK'ING, imp. FANKED, pp. *fănkt.*

FANNERS, FANNING: see under FAN.

FAN'NERS [see FAN]: machine with blowers employed to winnow grain. In passing through the machine, the grain is rapidly agitated in a sieve, and falling through a strong current of wind, created by a rotatory fan, the chaff is blown out at one end, and the cleansed particles fall out at an orifice beneath. See BLOWING-MACHINE. The apparatus is chiefly of wood. and is moved by hand, or connected with the driving power of a thrashing mill or other engine. The fanners superseded the old and slow process of winnowing. which consisted in throwing up the grain by means of sieves or shovels while a current of wind, blowing across the thrashing floor, carried away the chaff. When the first machine was introduced into Britain, by a farmer in Scotland 1737, it met strong opposition, as interfering with the Divine prerogative which alone had power over the winds. But the advantages soon overcame the prejudice whose record Walter Scott has preserved in *Old Mortality*—making Mause Headrigg speak anachronously to her mistress about 'a newfangled machine for *dighting* the corn frae the chaff, thus impiously thwarting the will o' Divine Providence, by raising wind for your leddyship's use by human art, instead of soliciting it by prayer, or patiently waiting for whatever dispensation of wind Providence was pleased to send upon the shieling-hill.'

FANNING, *făn'ing*, DAVID: 1756–1825; b. Wake co., N. C.: tory marauder. He was a carpenter by trade, and espoused the British cause in the latter part of the revolutionary war. in revenge for having been robbed by men calling themselves whigs He organized a band of desperadoes in Chatham and Randolph counties, hung a number of whigs, desolated their settlements, captured the town of Pittsborough while a court was in session and carried off all the judges, lawyers, and spectators, raided Hillsborough the capital and captured Gov. Burke and his entire staff, and took the American Col. Alston and a guard of 30 men from his own house. He was commissioned a col. of militia by the British; fled to Fla., and then to St. John, N. B. after the war; became a member of the provincial assembly, was sentenced to be hanged for fresh crimes, 1800, and escaped to Digby, N. S., where he lived quietly till death.

FANO, *fâ'nō* [Lat. *Fanum Fortunæ,* named from the temple of Fortune which the Romans erected here in commemoration of the defeat of Asdrubal on the Metaurus]: town and seaport of Italy, province of Urbino e Pesaro, finely situated in a beautiful and fertile district on the shore of the Adriatic, 30 m. n.w. of Ancona, near the mouth of the Metaurus. It is well built surrounded with walls and ditches, has a cathedral dedicated to St. Fortunato, and numerous churches containing many valuable paintings, among which are several of the best works of Domenichino, and an excellent 'Annunciation' by Guido. The remains of a triumphal arch of white marble, raised in honor of Augustus, are perhaps the chief object of classical interest. There is considerable trade in corn and oil, and in silk goods. Here, 1514, Pope Julius II. established the first printing-press with Arabic letters known in Europe. The port of F. was formerly well known to the traders of the Adriatic; its commerce, however, has declined, and the harbor is partly choked with sand.—Pop. 9,500.

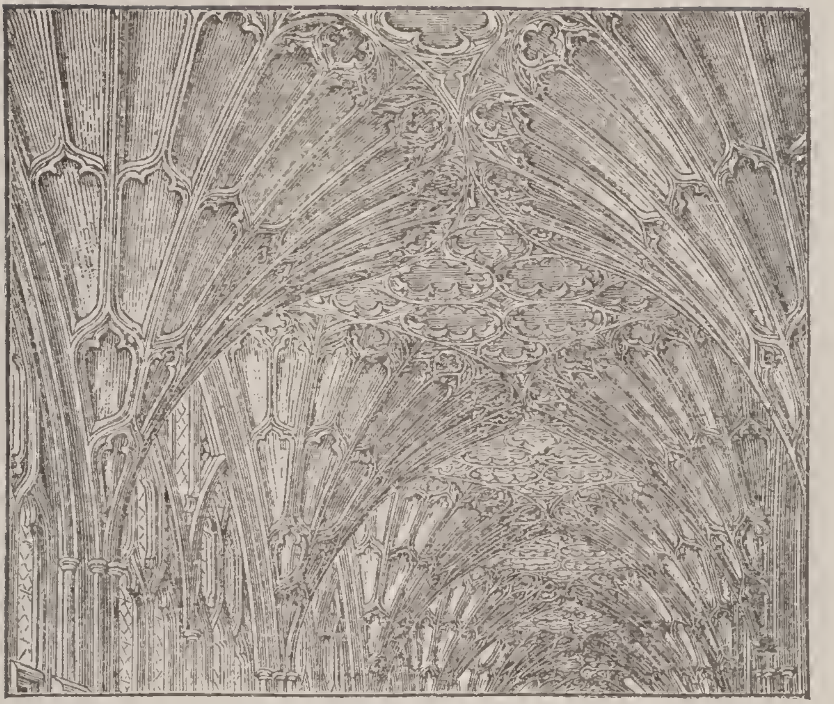
FAN PALM: name common to all palms which have fan-shaped leaves, as the species of *Mauritia, Lodoicea* (Double Cocoa Nut), *Hyphæne* (Doum Palm), *Corypha, Livistona, Chamærops,* etc. The only truly European palm, *Chamærops humilis* (q.v.), is a F. P., as is also the N. American Palmetto. The Talipot Palm (*Corypha umbraculifera*) is called sometimes the Great Fan Palm. The Palmyra Palm is another fan palm. The fan-shaped leaf is produced by an abbreviation of the midrib of a pinnated leaf.

FANS, The: race of aborigines in Equatorial Africa, between the Gaboon and the Ogobai rivers, accurately, described first by Du Chaillu. They are a fine capable race of savages, but are habitual cannibals.—The *Fantis* are a race of Negroes (q.v.) on the Gold Coast.

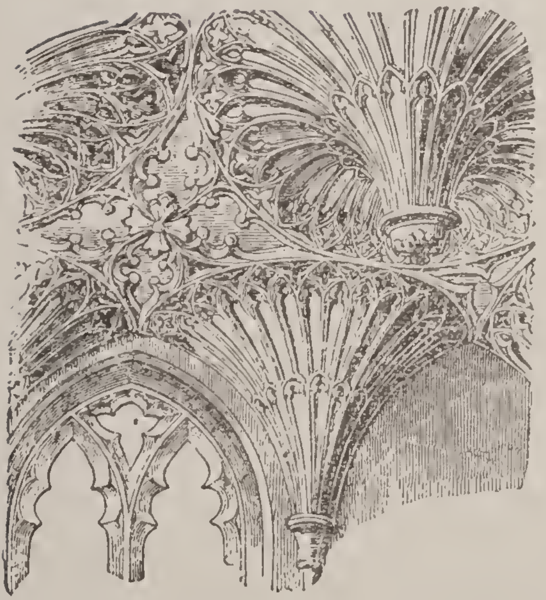
FANSHAWE, *făn'shaw,* Sir Richard: 1608–66: author and royalist partisan. He studied at Cambridge; and 1626, became a member of the Inner Temple. On the outbreak of the civil war, he took part with the king; and 1648, became treasurer to the navy under Prince Rupert. He was taken prisoner at the battle of Worcester; and on his release, withdrew to Breda in Holland, where Charles II. was holding his court in exile. After the Restoration, he was appointed ambassador at the court of Madrid, where he died. His most celebrated work, now very rare, is a translation of Guarini's *Pastor Fidor,* the lyrical passages of which are rendered with remarkable skill and elegance. The volume in which it appeared, 1664, contains other pieces in prose and verse.

FANTASIA, n. *făn-tâ'zhĭ-ă* [It.]: in *music,* a composition similar to the capriccio. The name is given also to extempore effusions performed by a musician with the rare gift of producing off-hand music like a well-studied composition. Hummel was more celebrated for his extempore fantasias on the pianoforte than even for his published compositions. Frederick Schneider was equally great in free fantasias on the organ.

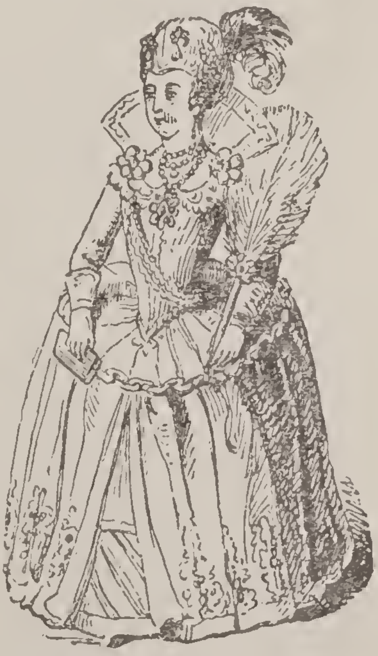
PLATE 11.



Fan-tracery, from the Cloisters, Gloucester Cathedral.



Fan-tracery Vaulting, Beauchamp Chapel, Warwick.

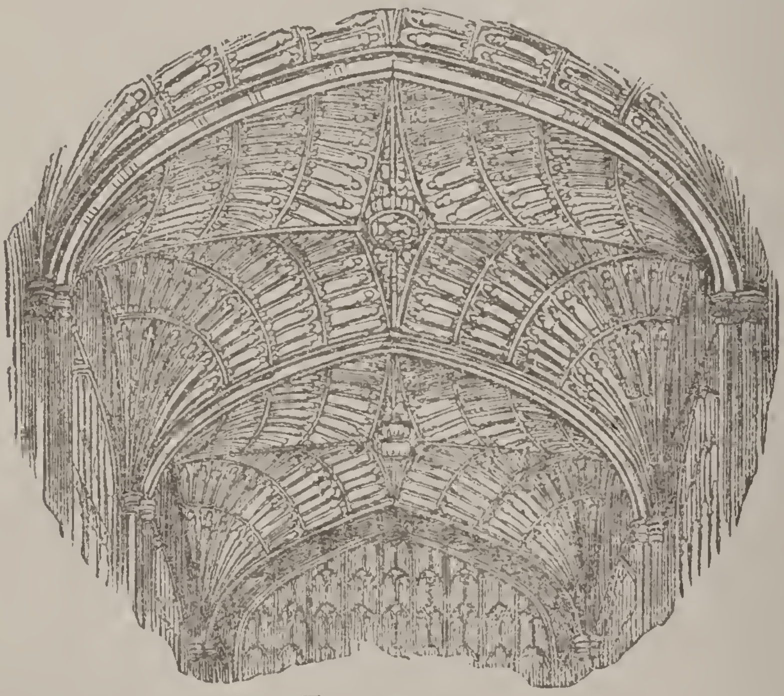


Farthingale, time of Queen Elizabeth.

FANTASTIC, a. *făn-tăs'tĭk*, or Fantas'tical, a. *-tĭ-kăl* [F. *fantasque* and *fantastique*, fantastic—from mid. L. *fantàstĭcŭs*, capricious, disorderly—from Gr. *phantasĭă*, vision, fancy (see Fancy)]: imaginary; fanciful; unreal; full of absurd fancies; capricious. Fantas'tically, ad. *-lĭ*. Fan'tasy, n. *-tă-sĭ*, the original spelling of Fancy, which see.—Syn. of 'fanastic': see under Fancy.

FANTOCCI'NI: see Puppet.

FAN-TRACERY VAULTING: in *architecture*, a kind of Late Gothic vaulting (15th c.), so called from its resemblance to a fan. The ribs or veins spring from one point, the cap of the shaft, and radiate with the same curvature, and at equal intervals, round the surface of a curved cone or polygon, till they reach the semicircular or polygonal ribs which divide the roof horizontally at the ridge level. The spaces between the ribs are filled with foils and cusps, resembling the tracery of a Gothic window; hence the name *fan-tracery*. The spaces between the outlines of the fans at the ridge level, are called by Prof. Whewell (*German Churches*) ridge lozenges. In Henry VII.'s Chapel, Westminster, one of the best examples of this kind of vaulting, these lozenges are occupied by pendants, which produce a most astonishing effect, seeming to be arches resting on nothing. They are, however, supported with greath ingenuity by internal arches, rising high above the visible vaulting. This peculiar feature is one of the *tours de-force* which astonish the common crowd, but are adopted only when art has degenerated into artifice. Fan-tracery is a very beautiful kind of vaulting, and is peculiar to England, where it originated, and where alone it was practiced. Among the finest examples besides Henry VII.'s Chapel at Westminster, are St. George's, Windsor; and King's College Chapel, Cambridge. Fan-tracery is



Fan-tracery:
From King's College Chapel, Cambridge.

frequently used also in the vaulting of cloisters, as at Canterbury, Chester, etc.

FAP, a. *făp* [Gael. *faob*, a protuberance]: in *OE.*, swollen with drink; dead-drunk.

FAR, a. *fâr* [AS. *feor;* Goth. *fairra*, far: Icel. *fjarri;* Sw. *fjerran*, afar]: distant; remote; more distant; remoter of the two: AD. remotely; very much; in a great part, as 'the night is *far spent*'. FAR'NESS, n. remoteness. FAR-FAMED, widely celebrated. FAR-FETCHED, strained, forced; unnatural. BY FAR, very much. FAR OTHER, very different. FAR OFF, at a great distance. FAR ABOUT, going much out of the way. FROM FAR, from a great distance. FAR SPENT, in *OE.*, well advanced; nearly at an end; well passed away: see FARTHER and FURTHER.

FARAD, n. *făr'ăd* [after *Faraday*]: see ELECTRICAL UNITS.

FARADAY, *făr'a-dā*, MICHAEL, D.C.L.: one of the most distinguished chemists and natural philosophers of the present century. 1791, Sep. 22—1867, Aug. 25; b. Newington, near London; son of a blacksmith. F. was a splendid instance of success obtained by patience, perseverance, and genius, over obstacles of birth, education, and fortune. He was early apprenticed to a bookbinder; yet devoted his leisure hours to science, and made experiments with an electrical machine of his own construction. Chance having procured him admission, 1812, to the chemical lectures of Sir H. Davy (q.v.), then in the zenith of his fame, he ventured to send to Davy the notes he had taken, with a modest expression of his desire to be employed in some intellectual pursuit. Davy seems to have at first endeavored to discourage him, but finding him thoroughly in earnest, soon engaged him as his assistant at the Royal Institution. He travelled with Davy to the continent, as assistant and amanuensis. On their return to London, Davy confided to him the performance of certain experiments, which led in his hands to the condensation of gases into liquids by pressure. Here he first showed some of that extraordinary power and fertility which have given his name celebrity, and which led to his appointment, 1827, to Sir H. Davy's post of prof. of chemistry in the Royal Institution. In the following summary his more important discoveries and published works are arranged, not chronologically, but according to various departments of science.

In chemistry, his treatise on *Chemical Manipulation*, 1827; 2d ed. 1842, is even now a very valuable book of reference. His *Lectures on the Non-metallic Elements*, and *Lectures on the Chemical History of a Candle*, delivered at the Royal Institution 1860, were published shortly afterward. Notable as discoveries or investigations of a high order are—New Compounds of Chlorine and Carbon, 1821; Alloys of Steel, 1822; Compounds of Hydrogen and Carbon, 1825; Action of Sulphuric Acid on Naphthaline, 1826; Decomposition of Hydrocarbons by Expansion, 1827; and the very valuable series of experiments 1829–30, on the manufacture of Glass for Optical Purposes, which resulted in one of his greatest discoveries, mentioned below.

As practical applications of science, his Preparation of the Lungs for Diving, and Ventilation of Light-house Lamps, are conspicuous; also his celebrated letter on Table-turning, and his lecture on Mental Education.

Of his publications on physical science, the most prominent are the Condensation of the Gases (already referred to): Limits of Vaporization, Optical Deceptions, Acoustical Figures, Regelation, Relation of Gold and other Metals to Light, and Conservation of Force. Of these, the condensation of gases into liquids and solids, though previously effected by others (and F. was ever foremost to acknowledge another's priority), he really made his own, not only by the extent and accuracy of his experiments, but by the exquisite experimental methods by which he effected the results. His ideas on regelation, and its connection with the motion of glaciers, have not had universal acceptance, though (see HEAT: ICE: GLACIER) there is no dispute as to his correctness in *facts.* In regard to Conservation of Force, there can be no doubt that he was led into a fallacy, by mistaking the technical use of the word *force* (see FORCE), for in his article on the subject he describes experiments made with the view of proving the conservation of *statical,* not *dynamical* force, whereas the doctrine of conservation asserts merely the conservation of 'energy,' which is *not* statical force. He *may* be right also, but if so, it will be by a new discovery, having no connection whatever with 'conservation of energy.'

His Christmas lectures at the Royal Institution, though professedly addressed to the young, are profitable to all. His manner, his unvarying success in illustration, and his felicitous choice of expression, though the subjects were often most abstruse charmed and attracted all classes of hearers. *Lectures on the Physical Forces,* is a simple work, but in reality most profound, even in its slightest remarks.

But the great work of his life is the series of *Experimental Researches on Electricity,* published in the *Philosophical Transactions* during more than 40 years. Fully to understand all the discoveries contained in that extraordinary set of papers, would require a knowledge of all that has been discovered during that time as to Electricity, Magnetism Electro magnetism, and Diamagnetism. The following, almost all, are discoveries of the *first* order. They are, in the order of publication, nearly that of discovery also: 1. Induced Electricity, 1831, comprehending and explaining a vast variety of phenomena, some of which have already been applied in practice (especially as Magneto electricity) to light-houses, electro-plating, firing of mines, telegraphy, and medical purposes. Electric currents derived from the earth's magnetism. 2. The Electronic State of Matter, 1831; 3. Identity of Electricity from Different Sources, 1833; 4. Equivalents in Electro-chemical Decomposition, 1834; 5. Electrostatic Induction—Specific Inductive Capacity, 1838; 6. Relation of Electric and Magnetic Forces, 1838; 7. The Electricity of the Gymnotus, 1839; 8. Hydro-electricity, 1843; 9. Magnetic Rotatory Polarization, 1846. effected by means of the optical glass already mentioned; 10. Diamagnetism and the magnetic Condition of *all* Matter, 1846; 11. Polarity of Diamagnetics, and the Relation of Diamagnetism to Crystalline Forces, 1849; 12. Relation of Gravity to Electricity, 1851 (this, as before remarked, is F.'s attempt to prove a conservation of *statical* force). 13. Atmospheric Magnetism, 1851. An attempt to explain the diurnal changes of the earth's magnetic force by the solar effect on the oxygen of the air.

F., who had received a pension 1835, was in 1858 appointed a house in Hampton Court. In 1862 he gave his last discourse on 'gas-furnaces;' and advocated the use of magneto-electric light in light-houses. In 1865 he resigned the position of adviser to the Trinity House, also that of director of the laboratory of the Royal Institution. See Life by Tyndall (1869), Bence Jones (1870), and J. H. Gladstone (1872).

FARADIC, a. *fa-răd'ĭk* [F. *faradique*]: pertaining or relating to faradization. Faradism: same as Faradization.

FARADIZATION: see Electricity, Medical.

FARALLONE ISLANDS, *fâ-râl-yō'nĕ:* cluster of six rugged, pointed islets in the Pacific Ocean, 23½ m. w. by s. of the Golden Gate, or entrance to the bay of San Francisco, Cal. The s.e. and largest extends nearly a m. e. and w., is 340 ft. high, contains numerous caves, and has a lighthouse on its tallest peak. All the islands are frequented by sea-gulls, murres, shags, and sea-parrots, beside rabbits and sea-lions; and are owned by a company which gathers the eggs of the gull and murre for the San Francisco market, where they command 25–35 cents per dozen.

FARANDOLA, n. *fâ-rân'dŏ-la* [F. *farandoule*]: dance popular among the peasants of the south of France and the neighboring part of Italy; called sometimes the Spanish Dance.

FARCE, n. *fârs* [F. *farce*, the stuffing in meat—from L. *farcīrĕ*, to stuff—*lit.*, force-meat or stuffing]: anything stuffed with foreign matters; a dramatic piece of a low comic character, full of exaggeration and drollery; anything absurdly exaggerated. Farced, a. *făr'sĕd*, in OE., stuffed. Farceur, n. *fâr-sėr* [F.]: writer of farces; a joker Farcical, a. *fâr'sĭ-kăl*, of or relating to a farce; droll. Far'cically, ad. *-lĭ*.—*Farce* differs from comedy proper in degree and not in kind. The aim of both is to excite mirth; but while the former does so by a comparatively faithful adherence to nature and truth, the latter takes much greater license, and does not scruple to make use of any extravagance or improbability that may serve its purpose. It does not, therefore, exhibit, in general, a refined wit or humor, but contents itself with grotesque rencontres, and dialogues provocative of fun and jollity. The name is differently explained. In any case, it comes originally from the Latin *farcire*, to stuff, but while Adelung says that, in the middle ages, *farce* signified in Germany certain songs between the prayers during divine service, others derive it from the Italian *farsa*, this from the Latin *farsum* (stuffed); while Paolo Bernardi states that it comes from a Provençal word *farsum*, meaning a *ragout*, or mess of different ingredients, an opinion which has this in its favor—that the *dramatis personæ, Jack-pudding,* etc., were generally named after special dishes or mixtures. The first farces are said to have been composed by the society of the *Clercs de Bazoche* in Paris, about 1400, as a contrast to the ecclesiastical plays performed by the religious orders. The most widely celebrated and the oldest is the *Farce de Maître Pierre Pathelin,* which some assign to the 13th c., but which was more probably executed by one Peter Blanchet, about 1480. Subsequently, Molière elevated and refined the farce into pure comedy, in his *Médecin Malgré lui, Malade Imaginaire, Les Fourberies de Scapin,* and other inimitable productions. In England, the origin of the modern farce dates from about the beginning of the 18th c. It then began to be regarded as something distinct from comedy proper, and to constitute a special theatrical entertainment. Of the numerous farces which have been performed before English audiences, only those of Samuel Foote have kept a place in literature.

FARCY, n. *fâr'sĭ* [It. *farcina;* F. *farcin*—from mid. L. *farcimĭnŭm*]: a disease in horses allied to the glanders (q.v.) which it usually precedes and accompanies. The absorbent glands and vessels, usually of one or both hind limbs, are inflamed, tender, swollen, hard, and knotted. The vitiated lymph thus poured out softens, and ulcers, or farcy buds appear. Unlike the ulcers of glanders, they are curable, but require time and care. They must be scarified with the hot iron, which, to prevent their spreading, may also be gently run over the adjacent sound skin. Good feeding and comfortable lodgings are essential, and, if not interfering with the appetite, tonics, should be given, such as a drachm each of sulphate of copper and iodine, twice daily. FARCY-BUD, n. in *vet. surg.*, little tumor which appears on the face, neck or inside of the thigh of horses; generally the first indication of farcy.

FARDAGE, n. *fârd ĭj* [F.]: in *naut.*, dunnage, loose wood, coir, etc., stowed among cargo to prevent it from shifting, or placed below dry goods to keep them from being injured by bilge-water.

FARDEL, n. *fâr'dĕl* [Sp. *fardillo,* a bale, a bundle: OF *fardel*—from F. *farde,* a bale—from Ar. *farda,* one of two bales on a camel's humps]: in *OE.*, a little pack; a bundle: V. to make up in little bundles. FAR'DELLING, imp. FARDELLED, pp. *fâr'dĕld.*

FAR'DEL-BOUND: disease of cattle and sheep, consisting in impaction of the fardel bag, or third stomach, with food, which is taken in between the leaves of this globular stomach, there to be fully softened and reduced. When the food is unusually tough, dry, or indigestible, consisting, for example, of overripe clover, vetches, or rye-grass, the stomach cannot moisten and reduce it with sufficient rapidity; fresh quantities continue to be taken up, until the overgorged organ becomes paralyzed, its secretions dried up, and its leaves affected with chronic inflammation. The slighter cases common among stall-fed cattle are 'loss of cud,' indigestion, and torpidity of the bowels. In severer form, there is also fever, grunting, swelling up of the first stomach, and sometimes stupor or epilepsy. The overgorged stomach can, moreover, be felt by pressing the closed fist upward and backward underneath the false ribs on the right side. The symptons often extend over ten days or a fortnight. Purgatives and stimulants are to be given. For a full-grown beast, give, in three or four bottles of water or thin gruel, ½ lb. each of common and Epsom salt, 15 ground croton beans, a dram of calomel, and two ounces of ginger. If no effect is produced, repeat this in 12 or 15 hours Inject soap and water clysters every hour, withhold all solid food and allow only sloppy mashes, treacle and water, or thin linseed tea. An occasional bottle of ale, with an ounce or two of ginger, often expedites the action of the physic, and wards off nausea and stupor.

FARDINGALE: see FARTHINGALE.

FARDING-BAG, n. *fârd'ing băg:* the first stomach of a ruminant animal, in which green food lies until it is chewed over again; the rumen.

FARE, n. *fär* [Icel. *fær*, previous, passable; *feria*, a passage boat: Ger. *fähre;* Dut. *vaer*, a ferry: connected with succeeding FARE]: the price or sum paid for conveyance by land or water; a passenger; in *OE.*, a journey; a passage: V. in *OE.*, to go; to travel. FA'RING, n. a journey.

FARE, v. *fär* [Goth. *faran;* Icel. *fara;* Ger. *fahren* to go, to get on]: to be in any state, good or bad; to get on; to feed; to be entertained; to happen: N. prepared food; provision; victuals; entertainment. FA'RING, imp. FARED, pp. *färd*, got on; succeeded. TO FARE WELL OR ILL, to be prosperous or the contrary.

FARE-FOLK, n. *fär'fōk* [etym. doubtful; probably for fairy-folk]: fairies; elves.

FAREHAM, *fär'ham:* market town and sea-bathing place in the s. of Hampshire, England, on a creek at the n.w. end of Portsmouth harbor, 12 m. e.s.e. of Southamptom, 9 m. n.n.w. of Portsmouth. It has manufactures of earthenware.—Pop. (1881) 7,171.

FAREL, *fâ-rĕl'*, GUILLAUME: 1489–1565, Sep. 13; b. in Dauphiné: one of the most active promoters of the Reformation in Switzerland. He studied at Paris, and was distinguished at first by his extravagant zeal for the practices of the Rom. Cath. Church. 'Truly,' says he in one of his letters, 'the papacy itself was not so papistical as my heart.' Intercourse with the Waldenses, and with his friend Lefevre d'Etaples, induced him to study the Scriptures; the result was his conversion to Protestantism, and F., who was by nature vehement even to indiscretion, immediately commenced to proselytize. The chief scene of his labors was France and Switzerland. At Basel, 1524, Feb. 15, he opened his career of controversy and evangelization by publicly sustaining 30 theses on the points in dispute between Rom. Catholicism and Protestantism. In less than two months, he was compelled to leave, mainly on account of a quarrel with Erasmus, whom. on account of his moderate or trimming policy, F. had compared to Balaam. F. went next to Strasbourg, afterward to Montbeliard, where his iconoclastic way of preaching the gospel excited the alarm of his friends, several of whom, Œcolampadius among others, censured him sharply for his violence. His zeal was manifested next in the canton of Bern. It was chiefly through his exertions that the towns of Aigle, Bex, Olon, Morat, and Neuchâtel followed the example of Bern in embracing the Reformation. In 1532, he went to Geneva, where his success was at first so great, that on account of the agitation excited, he had to leave the city. He returned 1533, was again compelled to withdraw, but once more entered it 1534. This was his year of triumph; the Reformers filled the churches, and the Rom. Cath. clergy, who had made themselves odious to the citizens by abetting the despotic schemes of the Duke of Savoy, retired to Lausanne and Fribourg. In 1535, Aug., the town council of Geneva formally proclaimed the Reformation. F., however, was a missionary, not a legislator, and the organization of the Genevan Church passed into the hands of Calvin (q.v.). The severity of the new ecclesiastical discipline produced a reaction, and in 1538, Apr., the two reformers were expelled from the city. F. took up his residence at Neuchâtel, where the reformed church was in deplorable disorder. He composed its differences, and drew up a constitution, which it accepted, after long and stormy debates, 1542. In Sep. he was fighting the battle of the Reformation at Metz. After his return to Neuchâtel, he frequently visited Calvin, whose authority in Geneva had been completely restored. It was on one of these occasions that he was present at the burning of Servetus, and though not, comparatively speaking, a bigoted Calvinist, he allowed his orthodoxy on that occasion to choke his humanity, exclaiming, as the unhappy heretic uttered his last prayer to God from the flames: 'See what power the devil has over one who has fallen into his hands.' In 1557, with Beza, he was sent to the Prot. princes of Germany, to implore their aid for the Waldenses, and on his return—inexhaustible in his activity—he sought a new sphere of evangelistic labor in the regions of the Jura Mountains. When on the verge of threescore-and-ten, he married a young wife, much to Calvin's disgust, who sarcastically speaks of him under the circumstances as 'our poor brother.' But neither his newly formed domestic ties, nor the infirmities of age, could quench his missionary zeal. In 1560-1, he went to his native Dauphiné, and passed several months at Gap, preaching against Romanism with all the ardor of his youth. In 1561, Nov., he was thrown into prison, but was soon rescued by his friends. In 1564, he paid a visit to the dying Calvin; his strength, however, was nearly exhausted, and he expired at Neuchâtel, leaving a son named Jean, who survived him only three years. F. was a man of extensive scholarship, and wrote largely, but his works very inadequately represent the genius of the man. Compare Kirchhofer's *Das Leben Wilhelm Farels* (2 vols. Zurich, 1831–33), and C. Schmidt's *Etudes sur Farel* (Strasbourg, 1834); also his *Wilhelm F. und Peter Viret* (1860).

FAREWELL, n. *fär'wĕl* [*fare*, and *well*]: a kind wish or wish of happiness at parting; an adieu: ADJ. leave-taking, as farewell wishes. FARE-YOU-WELL, ad., or FAREWELL, ad. good-by; adieu.

FAREWELL, *fär'wĕl*, CAPE: see CAPE FAREWELL.

FAR-FET, a. *fâr'fĕt:* in *OE.*, abbreviation of *far-fetch*, or *far-fetched;* studiously sought for; highly elaborated. FAR-FETCHED, *-fĕcht*, brought from remote places; not introduced naturally and easily; over-strained.

FARGO, *fâr'gō:* city, cap. of Cass co., N. Dak.; on the Red River of the North, and the St. Paul Minneapolis and Manitoba Short Line and the Northern Pacific railroads; 251 m. n.w. of St. Paul, 254 m. w. of Duluth, opposite Moorhead, Minn. It is at the head of navigation on the Red river, in the great agricultural region of the famous Red river valley, is an important wheat-shipping market, and the commercial centre of the "new northwest." It contained (1902, Mar.) 3 national banks (cap. of those reporting $300,000), 1 state bank, 2 private banks, and 1 mortgage and investment company; 12 churches; Presb. seminary, Congl college, and Rom. Cath. acad.; commodious Y. M. C. A. building; high and grammar schools, with 2 brick buildings (cost $80,000 and $15,000); 28 hotels; 3 public halls; opera-house; theatre; co. court-house (cost $100,000); Holly system of water-works; gas and electric-light plants; street railroad; and 3 daily, 3 weekly, and several monthly periodicals. The industries of F. included the largest agricultural implement depot in the n.w.; 3 grain elevators, with capacity of 250,000 bushels; planing and paper mills; extensive brick-yards; round-houses and car-shops of the Northern Pacific railroad; and numerous minor manufactories. In 1871 the site of F. was comprised in an Indian reservation; 1873 the Indian title was extinguished, the town plotted, and named after William G. Fargo (1818, May 20—1881, Aug. 3), a director of the Northern Pacific railroad, and a pioneer in the express business. Then came a period of inactivity, occasioned by the financial panic and the cessation of the railroad construction. Late in 1875 the remarkable fertility of the region was demonstrated by the success of the great Dalrymple farm, and F. received a large share of the attention given that part of the n.w. In 1878 it had pop. less than 800, and in the following year the first decided and marked movement, so far as local development is concerned, was made. Since then unfailing crops, the completion of the railroad, the construction of several branch roads, and the energy of its citizens have made it one of the notable new cities of the great west. Pop. (1880) 2,693; (1885) 8,201; (1890) 5,613; (1900) 9,589.

FARIA Y SOUSA, *fă-rē'ā ê sō'zâ*, MANOEL: 1590, Mar. 18—1649, June 3; b. of an anc. family, at Caravella, province of Entre Minho e Douro, Portugal: historian and poet. He studied at the univ. of Braga, and entered the service of the Bp. of Oporto; but shortly after 1613 he went to Madrid, where, however, he did not long remain. In 1631, he obtained the office of sec. to the Spanish embassy at Rome, where his extensive acquirements procured him the notice of Pope Urban VIII. and of all the learned men of the city. After some time, he returned to Spain, and died at Madrid. F.'s writings are partly in Spanish, partly in Portuguese. Of the former, are, *Discursos morales y politicos* (2 vols. Madr. 1623–26), *Epitome de las Historias Portuguesas* (Madr. 1628), *Comentarios sobre la Lusiada* (2 vols. Madr. 1639), *Asia Portuguesa* (3 vols. Lisbon 1666–75), *Europa Portuguesa* (3 vols. Lisbon 1678–80), *Africa Portuguesa* (Lisbon 1681), and the greater portion of his poems, which he collected under the title of *Fuente de Aganippe o Rimas Varias* (Madr. 1644–46). These poems consist of sonnets, eclogues, canzones, and madrigals. F., however, composed about 200 sonnets and 12 eclogues in Portuguese; and it is mainly by these, and by three theoretical treatises on Poetry, that he has influenced the development of the poetic literature of Portugal, in which he was long regarded as an oracle. His poetry shows talent and spirit, but is on the whole tasteless and bombastic.—F. is not to be confounded with another Portuguese author of the same name (b. Lisbon 1581, d. Evora 1655), who was one of the most learned numismatists of his age.

FARIBAULT, *fă-rē-bō':* city, cap. of Rice co., Minn.; on the Cannon river at its junction with the Straight river; on the Chicago Milwaukee and St. Paul railroad; 15 m. n. of Owatonna, 53 m. s. of St. Paul. It contains a state asylum for the deaf, dumb, and blind, fine court-house, public library, Seabury (Prot. Episc.) Divinity School, Rom. Cath. acad. and convent, the Shattuck School, 2 national banks (cap. $130,000), 14 churches, and manufactories of bricks, plows, furniture, and carriages. Pop. (1870) 3,045; (1880) 5,415; (1885) 6,459; (1890) 6,524; (1900) 7,868.

A conditional transfer of the Rom. Cath. parochial schools in F. and Stillwater to the state authorities by Abp. John Ireland (q.v.) 1891 led to a spirited discussion in Rom. Cath. and Prot. circles, to the toleration of the scheme by the Sacred Congregation of the Propaganda and the pope 1892, and to the designation of the abp.'s educational arrangement as the 'Faribault plan.' The 'plan' was discontinued in Faribault 1893, owing to differences that arose between the school board and the ecclesiastical authorities over the assignment of two Protestant teachers to a building which had been rented from the Roman Catholics. On the advice of the archbishop the lease was annulled.

FARIDPUR, or Furreedpore, *fŭr-ēd-pôr'*, most western dist. of the Dacca div., of Bengal, British India; bet. lat. 22° 47′ 53″ and 23° 54′ 55″ n., long. 89° 21′ 50″ and 90° 16′ e.; bounded n. and e. by the Ganges or Padma river, w. by the Chanduá and Madhumati rivers, and s. by Bakarganj; 2,267 sq. m. The surface in general is low, flat, and swampy, and 1,143 sq. m. were under cultivation, more than one-half in rice, in 1871. F. is traversed by 3 large rivers, navigable the year round by the largest Indian steam vessels, and these rivers have numerous small branches which accommodate flat and light draught boats. Beside the Eastern Bengal railroad, which extends 22 m. w. to e. in the n., F. has 3 important railroads, the Calcutta and Jessor, 19 m. long, F. and Kalingar, 16 m., and the F. and Talma, 10 m. The whole dist. is frequently under water during inundations, and the huts of many villages are built on artificial elevations. F. is advancing rapidly in prosperity under British administration.—Pop. about 1,700,000.

FARINA, n. *fă-rē'nă* or *-rī'-* [L. *farīnă*, meal—from *far*, grain: It. *farina:* F. *farine*]: meal or flour; the fine dust or pollen of flowers collected by bees for feeding their larvæ (see Bee); starch. Farinaceous, a *făr'ĭ-nā'shŭs*, mealy; consisting or made of flour; capable of yielding flour or starch. Farinose, a. *făr'ĭ-nōs*, yielding or containing farina; in *bot.*, *entom.*, etc., covered with a light dust or powdery substance, like meal.—*Farina* is a term frequently extended to many substances, which agree with the meal of the corn-plants or Cerealia (q.v.), in containing much starch, and food made of such substances is often called *farinaceous*, its qualities more or less resembling those of the food derived from the cerealia. Of the different kinds of farina, those produced by mere trituration of the seeds of grasses (corn), hold the first place for usefulness. Most similar to them are those obtained in the same manner from certain other seeds: see Cerealia. The farina of the different kinds of Pulse (q.v.), or seeds of leguminous plants, has considerably different properties. For the qualities, chemistry, commercial importance, etc., of the different kinds of meal, see Meal.—Other farinaceous substances, consisting chiefly of starch, are obtained from roots—often from tubers—of plants of very different natural orders; some kinds also, as sago, from stems. Cassava meal, which contains with starch, much vegetable fibre and proteine or albuminous substances, is commonly called farina (*Farinha*) in many parts of S. America, where it is a principal article of food.—*Fossil farina, mountain milk*, or *Agaric mineral*, is a deposit of silicified animalcules, obtained from China, etc. In 100 parts, it consists of silica, 50½, alumina 26½, magnesia 9, water and organic matter 13, with traces of lime and oxide of iron.

FARINELLI, *fâ-re-nĕl'lē* (real name, Carlo Brosco); 1705, Jan. 24—1782, July 15; b. Naples: soprano singer. He studied music with Parpara, sang with great success in the leading Italian theatres, went to London 1734 and performed in England three years, and after a brilliant season in Paris, settled in Madrid 1737. There he became the

FARM, n. *fârm* [AS. *feorm*, a supper, hospitality; *feormian* to supply with food. F. *ferme*, an agreement, a farm—from mid. L. *firma*, a feast, a farm—from *firmus*, durable, lasting—*lit.*, a portion of land which supplies food]: a portion of land employed to raise food: V. to let or lease at a certain rent, as a portion of land, taxes, etc.; to cultivate land. FARM'ING, imp.: N. the business of a farmer. FARMED, pp. *fârmd.* FARMER, n. *fârmėr*, one who cultivates land; one who leases taxes at a fixed rent. To FARM TAXES, to let or lease taxes.—SYN. of 'farmer:' agriculturist; husbandman; tiller; cultivator.—*Farm*, in the United States, is a portion of land in pasture or cultivation managed usually by the owner: in Britain, a piece of land in pasture or cultivation, usually held in lease by a tenant from the proprietor. The honorable and independent position of farmers in the United States is well-known.—In Europe, the tenure on which land is held by farmers varies in different countries. In some parts of continental Europe, the farmer hires the land on the principle of a kind of partnership with the proprietor: see METAYER. In England, much of the land is let for a certain annual rent, and mostly either by a yearly term, or at the good-will of the landlord. Leases of different durations have latterly been introduced. Under the old Scotch 19 years' lease, the farmer is encouraged to starve the land towards the close of the period of contract, in order to recoup himself for his outlays in manure. The practical result is that the land is fully productive about half the duration of the lease. The vastly increased expenditure connected with farming, and the growing and already great necessity for the most being made of the limited land resources of Great Britain, call for more security to the tenant's capital than the lease provides. A strong movement has begun in Scotland and England for compensation to outgoing tenants for permanent improvements, and even unexhausted manures. This is as much a tenant's as a landlord's question, as it will require more capital to enter a farm than is presently needed. The landlord presumably provides the houses for the farms, but the higher farming of recent years has rendered the former supply of buildings insufficient, and there is difficulty in obtaining proper house accommodation on many farms, on estates where the landlord's capital happens to be locked up by the keys of entail. The method of paying rent for farms in Scotland is not uniform: in some districts the rent is a fixed sum; in others, such as the Lothians and best wheat-growing districts, it is often partly a fixed sum and partly in grain, etc.: see FIARS. At all times, however, the landlord has a right of Hypothec (q.v.) over the crops, and can take measures to avoid being defrauded of his proper claims. On land adapted for green cropping, and remote from towns, large farms form good subjects for capitalists, and consequently prevail. Stiff clay soils are rather against extensive culture. Where crops are grown that require much hand-labor, farms become small. Flax, rape, vines, and market-garden produce all tend to lessen the size of farms. In new countries farms are mostly small. Grazing farms, whether in the Scotch Highlands, Australia, or America, form good outlets for large capitalists.—For the different crops, animals, and processes, see the respective titles. See also AGRICULTURAL EDUCATION: AGRICULTURAL SOCIETIES: AGRICULTURE.

FARM BUILDINGS: constructions requisite for the various processes of husbandry. Proper buildings are essential to economical disposing of the produce of the farm. The grain crops are usually thrashed there, and a large portion of the green crops is consumed by stock, which must be provided with shelter from the cold. When few turnips were raised, and few cattle fed, large open courts were best suited for converting the straw into manure. Now in many cases, the excrements of the stock are sufficient for wetting all the straw, and hence has arisen the practice of feeding in covered courts and in boxes. In this case, the solid and liquid excrements are carted out with the straw which acts the part of a sponge. This is an excellent way of manufacturing home-made manure; it takes much straw, however; and as more green crops are raised and consumed on the farm, sufficient straw cannot always be got to absorb all the liquid; hence, a saving of the straw is effected by stall-feeding, when the excess of liquid must be collected into tanks, and otherwise disposed of. When the high price of ammonia is remembered, also that liquid manure contains a high percentage of ammonia, the utility of husbanding this material is evident. Liquid manures should be absorbed by moss or soil, or be carted out, and distributed by pipes, while the plants are growing, otherwise part will be washed out of the soil. Covered farm-yards are increasingly used, as the cheapest and best way of erecting farm-offices.

Ventilation.—Without good ventilation, a covered homestead must be a nuisance. All the apartments are so arranged that unless fresh air circulate through them, and they are kept perfectly clean, there must constantly be un wholesome effluvia in the interior—the foulness of one apartment being communicated to another. One system of ventilating a farmstead is here indicated—demanding, of course, ordinary care to keep the different houses clean, —Under each feeding-passage is built a circular air-shaft, 30 inches in diameter; in connection with these are feeding-mouths with gratings on the outside of the building; inside, are numerous finely perforated gratings; by sliding-valves, wrought by a cord and pulley, the supply of air is regulated. Besides these, there are gratings every 10 or 12 ft. along the exterior walls, perforated so as to admit near the floor considerable air. The roof, too, is provided with ventilators with vertical spars, and openings are left here and there in the sarking, as induction and eduction tubes. Numerous perforated apertures throughout the building admit twice the quantity of air required for the respiration of the animals, and are so under command that they will admit neither flies in summer, nor too much cold air in winter.—The above system of ventilation is somewhat expensive. A cheap yet efficient system is to cover the yards with pan tiles without plaster or lath. See *The Book of Farm Buildings*, by Henry Stephens, F.R.S.E., and R. Scott Burn (Edin., Blackwood & Sons, 3d ed. 1871).

Farm Laborers: people employed by the farmer in his processes of husbandry. In the vast area and varied agriculture of the United States, there is unlimited variety in the terms of engagement and rates of wages for such laborers. The diversified problem solves itself in practice under our free institutions. In the British islands, the collision between inherited usages and modern social demands, gives rise to serious questions, concerning the class known there as Farm-servants, whose wages are far lower than those of our more independent agriculture workers. The introduction of large farms caused a wide difference to arise in Britain between the condition of master and servant. The latter has had his condition partially meliorated, through very much remains yet to be done. Large farms effect economy in amount of labor, and where these superseded the small holdings or pendicles, a certain number of the population had to betake themselves to the towns or the colonies: this diminished population in country districts. The general advance, however, in the wages of labor has been to some extent shared by farm-servants for some years, and they are now better paid, though in general they are still miserably housed. Farmers now complain of the comparatively inferior class of servants even for the increased wage. In the agricultural counties wages are lower than in the manufacturing districts.

FARMER, *får'mėr*, **John**: 1789, June 12—1838, Aug. 13; b. Chelmsford, Mass.: genealogist. He spent the early part of his life teaching school and in business, and afterward applied himself to historical, antiquarian, and genealogical research. He was a founder of the N. H. Hist. Soc., and a member of numerous hist. and literary societies, published *Genealogical Register of the First Settlers of New England* (1829), *History of Billerica* (1806), *History of Amherst* (1820), *Gazetteer of New Hampshire* (1823), and contributed largely to the *Collections* of the N. H. and Mass. hist. societies.

FARMER, Richard, D.D.: 1735, Aug. 28—1797, Sep. 8; b. Leicester, England. He was entered a pensioner of Emmanuel College, Cambridge, 1753. In 1760, he took his degree M.D., and was appointed classical tutor of his college. It is not known when he took orders, but, while tutor, he acted as curate at Swavesey, a village eight m. from Cambridge. In 1766, he published his *Essay on the Learning of Shakespeare* (reprinted 1789, 1821), to show the sources whence the great dramatist derived his knowledge of the ancients. F. proved that is was from translations, and that Shakespeare has often cited the phraseology, and even the errors, of the translators. In 1775, he was elected to the mastership of Emmanuel College, and 1778, chief-librarian of the university. In 1780, he obtained a prebendal stall at Lichfield, which he resigned 1788 for the office of canon residentiary of St. Paul's.

FAR′MERS' ALLI′ANCE: association of farmers for advancing the interests of the agricultural population. The term F. A., in strictness, designates only one of many unions of farmers, but in common usage it is applied to all the politico-social and mutual-benefit organizations of agriculturists in the United States. Though these bodies exist as separate organisms, each with constitution, by-laws, officers, etc., of its own, the aims of all are nearly the same, and efforts are being made to unify them under a common name and a common constitution, or at least to procure their concurrent action for the common ends. The nature of these common ends may be understood from the resolutions passed 1890, Nov., by the national assembly of the Farmers' Mutual Benefit Assoc. (see at end of article), demanding revision of the patent laws; abolition of the national banking system; a circulating medium consisting of coin and U. S. treasury-notes; provision for loaning of money by the govt. to citizens, at moderate interest, on proper security; issue of govt. bonds of $10, $20, $50, and $100, bearing 2 per cent. interest, and redeemable at the option of the holder and the govt.; regulation of corporations by law; election of pres., vice-pres., and U. S. senators by popular vote.

The first considerable organization of farmers for politico-economic purposes was the *National Grange of the Patrons of Husbandry:* see HUSBANDRY, PATRONS OF. At the beginning of 1890 the Grange was organized in more than 30 states, and the number of active members was estimated at 150,000. Originally, the Grange did not contemplate organization of farmers for furtherance of agricultural interests through political action; the objects were rather mutual benefit, mutual improvement, commercial co-operation, and resistance to monopolies. It was asserted, 'emphatically and sincerely,' that 'the Grange is not a political or party organization.' The Grange was founded 1867.

A *Farmers' Alliance* was organized at Poolville, Parker co., Tex., 1879, by the exertions of William T. Baggett, who had, four yrs. previously, effected a union of the farmers of Lampasas co., under the same name, for resistance to land and cattle speculators. Like the Grange, the new organization declared itself non-political. Its purposes, as officially declared, were: 'to labor for the education of the agricultural classes in the science of economical government; to develop a better state, mentally, morally, socially, and financially; to create a better understanding, for sustaining civil officers in maintaining law and order;' and to assist one another in need. This assoc. was chartered by the state of Texas 1880; the state alliance was organized 1882: membership was restricted to white persons. At a convention (1886), 84 counties of Texas were represented. A union of the F. A. (of Texas) with the *Farmers' Union*, an assoc. of Louisiana farmers, was effected 1887, under the style, *Farmers' Alliance and Co-operative Union of Amer-*

ica. The consolidated body sent organizers and lecturers into other states of the w. and s.w., and the order spread quickly through Mo., Ky., Tenn., N. C., S. C., Ga., Ala., and Miss. A similar organization, known as *The Agricultural Wheel*, had already been in existence for some years in Mo., Ky., and Tenn., having been founded 1882, at Des Arc, Prairie co., Ark. The 'Wheel' and the 'Alliance and Union' sent delegates to a convention at Shreveport, La., 1887, for effecting a union of the two bodies, which was accomplished the following year, under the title, *Farmers' and Laborers' Union of America;* the style was changed Dec., 1889, to *National Farmers' Alliance and Industrial Union.*

The *National Farmers' Alliance*, a body distinct from the last named, has its strength in Ill., Wis., Minn., Io., the Dakotas, Neb., Kan., and Mo.; it had its rise in Cook co., Ill., 1877, as a local body; a national organization was effected 1880, when 500 delegates from local bodies in Mass., R. I., N. Y., O., Ind., Mich., Ill., Wis., Io., Neb., Mo., Ky., and Tex. met for that purpose in Farwell Hall, Chicago. The object was declared to be: 'to unite the farmers of the United States for their protection against class legislation, the encroachments of concentrated capital, and the tyranny of monopoly; . . . to oppose, in our respective political parties, the election of any candidate, state or national, who is not thoroughly in sympathy with the farmers' interests; to demand that the existing political parties shall nominate farmers, or those who are in sympathy with them, for all offices within the gift of the people; and to do anything, in a legitimate manner, that may serve to benefit the producer.' 1890, Jan., the National F. A. had about 400,000 members.

The *Farmers' Mutual Benefit Association*, mentioned in the beginning of this article, had its rise in Johnson co., Ill., 1883, and was chartered under the laws of the state 1887. The local membership, 1890, is given as 200,000, confined almost wholly to Ill. and Ind., though the assoc. has organizations in 10 other states. The declared objects of the assoc. are: 'to unite the farmers of Ill. and of the United States in all matters pertaining to their interests; to improve the modes of agriculture, etc.;' the 'declaration of purposes' of the order says nothing about political action, but the members are pledged 'promptly and fearlessly to place the stamp of condemnation on every business and profession which, in their judgment, is calculated to interfere with farmers' rights.'

The *Farmers' League* originated in Mass.; its strength lies in the e. states, but it has a national organization, and is spreading to the w. and s.; its specific objects are 'to advance the farmer's political welfare, securing to him due recognition and just representation in all elective and appointive offices affecting his welfare.' In particular, the Farmers' League attends to the agricultural interests in the matter of senators and representatives in the legislature. The national officers of the

Farmers' League, 1890, were: Geo. T. Powell, Ghent, N. Y., pres.; Herbert Myrick, Springfield, Mass., sec.; Walter P. White, Putnam, Conn., treas. The league is representative throughout. Any farmer may become a member on paying 50 cts. Five or more members may organize a town league, 5 towns a county league, 3 or more counties a state league.

The objects and aims of the several organizations may be understood from the foregoing account: the tendency of them all may be seen in the utterances of one of them —the National Farmers' Alliance and Industrial Union, which, 1890, gave expression as follows to its demands:

'We demand the abolition of national banks, and the substitution of legal-tender treasury-notes in lieu of national bank-notes, issued in sufficient volume to do the business of the country on a cash system—regulating the amount needed on a *per capita* basis, as the business interests of the country expand; and that all money issued by the government shall be legal tender in payment of all debts, both public and private.

'We demand that congress shall pass such laws as shall effectually prevent the dealing in futures of all agricultural and mechanical productions, preserving so stringent a system of procedure in trials as shall procure prompt conviction, and imposing such penalties as shall secure most perfect compliance with the law.

'We demand the free and unlimited coinage of silver.

'We demand the passage of laws prohibiting the alien ownership of land, and that congress take early steps to devise some plan to obtain all lands now owned by aliens and foreign syndicates; and that all lands now held by railroad and other corporations, in excess of such as is actually used and needed by them, be reclaimed by the government and held for actual settlers.

'Believing in the doctrine of "equal rights to all, and special privileges to none," we demand that taxation, national or state, shall not be used to build up one interest or class at the expense of another. We believe that the money of the country should be kept as much as possible in the hands of the people, and hence we demand that all revenues, national, state, or county, shall be limited to the necessary expenses of the government, economically and honestly administered.

'We demand that congress issue a sufficient amount of fractional paper currency to facilitate exchange through the medium of the United States mail.

'We demand that the means of communication and transportation shall be owned and operated in the interest of the people, as is the United States postal system.'

A later platform demands, among other things, the establishment of postal savings-banks by the govt.; opposes the issue by the United States of interest-bearing bonds, and demands the election of U. S. senators by direct vote of the people, each state to be divided into two districts of nearly equal voting-population

FARM'ERS-GEN'ERAL [Fr. *fermiers-généraux*]: name given before the French Revolution of 1789 to the members of a privileged association, who farmed or leased the public revenues of the nation. This peculiar system of tax-gathering dates from an ancient period. For each class of imposts there was a special administrative board, presided over by one of the F. G. or by one of his assistants. At first, the leasing of the public revenues was based on the competitive system, and determined by the estimates handed in; but latterly, every formality, every preliminary guarantee of this nature disappeared, and the leasing depended wholly on the favor or jobbery of the govt. officials. The minister of finance selected the F. G. at his pleasure, but his choice was always regulated by the present, or rather bribe (*pot-de-vin*) offered to him; which, we may presume, was never inconsiderable, inasmuch as its value was fixed by the minister himself. Generally, shares in the concern were assigned by the king to his favorites, male and female. The number of F. G. was ordinarily 40, but shortly before the Revolution it had risen to 60. The lease was signed by a salaried deputy, responsible to the king alone. The king occupied the position of a creditor toward the F. G., and could coerce them into payment of the stipulated sum as a just debt; the F. G., on the other hand, occupied a similar position toward their subordinates. The entire sum necessary to place in the national treasury—in other words, the annual national revenues—amounted to 180 millions of livres (now francs). The rest was outrageous extortion, for we are certainly within the mark in estimating it at seven millions of livres. The powers, rights, and duties of the F. G. were defined by special decrees; but however severe may have been the fiscal laws against fraud and contraband, it is notorious that, shortly before the Revolution, abuses of the most flagrant description had demoralized the system and the men. The consequence was inevitable. During the Revolution, most of these odious tax-gatherers perished on the scaffold, the comparatively innocent among them occasionally confounded with the guilty. Even the virtues and the learning of the illustrious Lavoisier could not save him.—Farmers of the revenue are an institution of ancient origin. The Roman *publicani* (q.v.) were officers of this kind; and duties of various kinds were at one time farmed in Great Britain: see EXCISE.

FARM'ING'S ISL'AND: island in the n. Pacific Ocean, n. of the Sandwich Islands; lat. 30° 49' n., and long 159° 20' w.; it was formally taken possession of, for the queen of England, 1861, Feb. 8, by her majesty's steamer *Albert*. The harbor was called English Harbor, and a point, on which there is a settlement, was termed English Point.

FARMINGTON, *fârm'ing-ton:* village of Hartford co., Conn.; on the F. river and the New Haven and Northampton railroad; 10 m. w.s.w. of Hartford, 31 m. n. of New Haven. This attractive village contains 7 churches, savings bank, money-order post-office, and several manufactories. Here for many years has been one of the most distinguished schools in the country for young ladies—an institution noted for scholarship, and for refinement. The American Board of Foreign Missions, earliest missionary soc. in the United States, was organized in F.—Pop of tp. (1870) 2,616; (1880) 3,017; (1890) 3,179; (1900) 3,331.

FARMINGTON: village, cap. of Franklin co., Me.; on the Sandy river; n. terminus of the Androscoggin div. of the Me. Central railroad; 36 m. n.w. of Augusta, 54 m. n. of Lewiston, 80 m. n.e. of Portland. F. is noted as an educational centre, having a state normal school, the Abbott Family School for Boys, the Wendell Institute for Girls, high school, and a number of superior graded schools. It contains a court-house, 6 churches, 1 national bank, 1 savings bank, 2 machine shops, several flour and saw mills, corn-canning factories, carriage, boot and shoe, and wood-novelties factories; and valuable slate quarries.—Pop. tp. (1870) 3,251; (1880) 3,353; (1890) 3,207; (1900) 3,288.

FARNE, *fârn* (or FEARNE, or FERN, *fèrn*) **ISLES** (or the STAPLES): group of 17 islets and rocks, some visible only at low tide, two to five m. off the n.e. coast of Northumberland, England, opposite Bamborough. On one of the isles is the tower of a priory, built to the memory of St. Cuthbert, who spent the last two years of his life here. There is a hole called the churn, through which the sea rises. The passage among the isles is very dangerous in rough weather. Two of the islets have each a light-house. Here the *Forfarshire* was wrecked 1838 (see DARLING, GRACE); and here, 1843, the *Pegasus* met the same fate, and 60 persons were drowned.

FARNESE, *fâr-nēz',* It. *fâr-nā'zā:* illustrious family in Italy, whose origin can be traced to the middle of the 13th c., when it possessed the castle of Farneto, near Orvieto. Many of its members have filled the highest offices in the church.—In 1534, Cardinal ALESSANDRO FARNESE was raised to the papal see under the title of Pope Paul III. (q.v.), and as his great aim was the aggrandizement of his family, he erected Parma and Piacenza into a duchy, which he bestowed on his natural son, Pietro.—PIETRO LUIGI FARNESE was one of the most dissolute men of his period, and after many tyrannical attempts to limit the privileges of the nobles, he was assassinated 1547, Sep. 10. —He was succeeded by his son OTTAVIO FARNESE (1520–85), who married a natural daughter of Charles V., and whose reign was marked by unbroken peace, and by various efforts made for the good of his subjects.

Alessandro Farnese (1546–92), son of Ottavio F., served his first campaign under his uncle, Don John of Austria, and distinguished himself at the battle of Lepanto, 1571. He afterward followed his mother into the Low Countries, then in insurrection, and aided in the victory at Gembloux, 1578, Jan. 31. He was made gov. of the Spanish Netherlands by Philip II., and carried on the war against the Prince of Orange. The ill success of the expedition against England, to the command of which he had been appointed by Philip II., grieved him the more from its contrast to his former successes. On his return to the Netherlands, he was appointed commander-in-chief of the army dispatched to the assistance of the Rom. Catholics in France, and compelled Henry IV. to raise the siege of Paris. Being, however, ill supplied with provisions and money by Philip, and insufficiently supported by the League, he was forced to yield to the superior power of Henry IV., and died soon afterward at Arras. He was really an able warrior, and though severe in his discipline, was almost worshipped by his soldiery.—Ranuccio Farnese (d. 1622), son and successor of Alessandro F., had not the brilliant qualities of his father: he was sombre, austere, greedy, and proud. A conspiracy was hatched against him, and Ranuccio was seized, and thrown into prison.—Odoardo Farnese (1612–46), natural son of the preceding, was a prince remarkable for the elegance of his manners, also, according to Muratori, for his magnificence, magnanimity, and liberality.—The family became extinct in the person of Antonio Farnese (d. 1731).

The name of the F. family has been bestowed on several celebrated works of art. These are—1. The *Farnese Palace* at Rome, built by Pope Paul III., before his accession to the holy see, after the design of Antonio da San Gallo. It is in the form of a quadrangle, and was completed by Michael Angelo. The palace is one of the finest in Rome. The antique sculptures for which it was formerly renowned are now in the Museum at Naples; a few classic works, however, remain in the great hall. The gallery contains the frescoes of Annibal Caracci, which are very valuable, as exhibiting in the most complete manner the new line of art which he struck out. In a room adjoining the gallery, are some mythological fresco-paintings by Domenichino. 2. The *Farnesina*, a very elegant palace in Trastevere. It owes its celebrity chiefly to the frescoes of Raphael; but it contains frescoes also by Peruzzi, Sebastian del Piombo, and a colossal head in *chiaroscuro,* attributed to Michael Angelo. Among the antiques, formerly belonging to the F. family, now in the museum at Naples, are two which still bear the name of their original owners. 3. The *Farnese Bull,* a colossal group attributed to Appollonius and Tauriscus of Tralles, in Asia Minor, who probably belonged to the Rhodian school, and lived about b.c. 300. The group represents Dirce bound to the horns of a bull by Zethus and Amphion, for ill usage of her mother—a subject which, notwithstanding the vigorous treatment, is on the whole unsatisfactory. Pliny mentions the transference of the group to Rome, where it first adorned the library of Asinius Pollio, and afterward the Baths of Caracalla. It was discovered anew in 1546, restored by Bianchi, and placed in the Farnese Palace. 4. The *Farnese Hercules*, copied by Glykon from an original by Lysippus. It exhibits the hero, exhausted by toil, leaning upon his club; the muscles and veins are still swollen, the head inclined, the expression melancholy; one hand rests upon his back, and grasps one of the apples of the Hesperides.

FARNESS: see under FAR.

FARNHAM, *fârn'am:* town in the w. of Surrey, England, on the left bank of the Wey, 10 m. w.s.w. of Guildford. It consists chiefly of one street running e. and west. The principal feature is the stately old castle of the bishops of Winchester, built first by Bishop de Blois, brother of King Stephen. The castle was razed by Henry III., rebuilt and garrisoned by Charles I., and restored, 1684, to its present state by Bp. Morley. It is an embattled quadrangle of brick, covered with stucco. A new town-hall was erected 1866. F. has belonged to the bishops of Winchester since 860, when Ethelbald of Wessex bestowed it on them. Some parts of the parish church were built in the 12th, 15th, and 16th c. The chief trade is in hops, a very fine variety of which is grown in the vicinity. William Cobbett was born and is buried here. Aldershott Camp (q.v.) is about 6 m. n. of F.—Pop. (1891) 5,545.

FARNOVIANS, n. *fâr-nō'vĭ-anz* [from *Farnovius*, latinized name of Stanislaus Farnowski]: in *eccles.* and *chh. hist.*, Polish Unitarian sect, which, under the leadership of Farnowski, separated from the rest of the Unitarian body 1568, and continued till their chief's death 1615.

FARNWORTH, *fârn'wĕrth:* town of Lancashire, England; two miles and a half s.e. from Bolton le-Moors, near the Tonge, a branch of the Irwell. It is a station on the Manchester and Bolton railway. It has a picturesque embattled chapel. of the 15th c. The town is thriving, and there are manufactures of sail-canvass, watches, files, etc. Pop. (1871) 13,723; (1881) 19,380 ; (1891) 23,758.

FARO, or PHARO, n. *får'ō* [It.]: game at cards of the nature of Hazard (q.v.), in evil repute as played chiefly for gambling purposes. FARO-BANK, n. bank or deposit of money against which the players play in the game of faro; gambling-house or room. See Hoyle's *Games*.

FARO, *fâ'rō:* pleasant and wealthy episcopal city of Portugal, cap. of the province of Algarve; in a plain at the mouth of the Fermoso, lat. 37° n., and long. 7° 52′ w. It has, on the whole, a modern aspect, but its houses are not handsome, and its streets are in general narrow. It is surrounded with walls said to have been built by the Moors. The harbor of F. is somewhat confined, but the roadstead formed by three islands at the mouth of the river affords good anchorage. F. has considerable exports of oranges, figs, anchovies, and cork. It has also a prosperous fishery.

The number of blind people here is surprising, groups of five and six together being frequently observed. This is accounted for by the light sandy soil.—Pop. 8,671.

FARÖE ISLES, *fā'rō* or *fā'rö'ē* [Dan. *Faar-Oen,* sheep-islands]: a group of islands, 22 in number, only 17 inhabited; belonging to Demark, lying nearly midway between the Shetlands and Iceland, 61° 25'—62° 25' n. lat., and 6°—8° w. long. The principal island, Stromoe (cap. Thorshavn), is 27 m. long, and 8 m. broad; those next in importance are Osteroe, Vaagoe, Bordoe, and Sudaroe; entire area nearly 500 sq. m. The F. I. consists of basaltic elevation, none of which attain a height of 3,000 ft., and trap formations, covered with a thin vegetable soil, which yields pasturage to the cattle and numerous sheep. There are no considerable valleys or streams, but small fresh-water lakes are numerous. The coasts which are steep and lofty, are broken by deep inlets, and there are whirlpools and rapids which render navigation perilous. The furious winds which prevail prevent the growth of trees, or even of most of the ordinary vegetables and cereals; but the climate is so greatly modified by oceanic influences that notwithstanding the high latitude, snow rarely lies long on the ground, and the cattle can pass the greater part of the year in the open air. Peat and coal are used for fuel; traces of iron and copper, and opal, chalcedony, etc., are found. The chief sources of wealth are flocks of sheep, and multitudes of sea-fowl which frequent the rocks. The Islanders are skilful in climbing the dangerous cliffs in search of birds, and they are expert in fishing for seals and whales. Their manufactures are of the homeliest kind, but in return for the numerous articles supplied to them by the mother-country, they yield tallow, train-oil, feathers, skins, and butter to the Danish markets. The people are of Norwegian origin, a vigorous, laborious, loyal, and religious race, and belong to the Lutheran Church. They are governed by a Danish *amtmand*, or bailiff, and a landvogt, or director of the police and municipal departments, and are represented in the Danish legislature by a deputy appointed by the king. The islands were discovered in the 9th c. by Norwegians, and have belonged to Demark since the incorporation of Norway with that kingdom by the Union of Calmar; and the language of the people is only a slightly modified form of the Old Norse. England held the islands from 1127 to the treaty of Vienna, in 1814. Some account of the Isles will be found in Prof. Sir Wyville Thomson's book, *The Depths of the Sea* (Macmillan & Co. 1873).—Pop. (1890) 12,954; (1901) **15,230.**

FAROESE, n. *fā'rō-ēz:* the language spoken in the Faroe Islands.

FAROLITE, n. *fā'rō-līt* [from the *Faroe Isles*]: a mineral of a pearly lustre, and a whitish or bluish color.

FARQUHAR, *fâr'kwâr* or *fâr'kėr,* George: 1678–1707; b. Londonderry, Ireland. He received his education at the Dublin Univ., where, though he did not take any degree, he secured the reputation of a wit who was a spendthrift of his witticisms. When he left the univ., he was engaged as an actor by one of the Dublin theatres, but, like most dramatists who have figured on the stage, he proved but an indifferent performer. Playing a part in Dryden's *Indian Emperor,* and forgetting that he wore a sword instead of a foil, he accidentally wounded a brother performer, and was so shocked by the occurrence that he at once quitted the boards. Accompanied by the actor Wilks, he went to London, and soon received a commission to the regt. commanded by the Earl of Orrery, then stationed in Ireland. Urged by Wilks, and perhaps stimulated by the gayety and leisure of a military life, he, 1698, produced his first comedy, *Love and a Bottle,* which proved a success. Two years afterward, his *Constant Couple* appeared, which had a brilliant reception, and to which he wrote a sequel, *Sir Harry Wildair.* In 1703, he produced *The Inconstant,* founded on the *Wildgoose Chase* of Beaumont and Fletcher, a version in which all the coarseness, and none of the poetry, of the elder dramatists is retained. He married in the same year, and falling into serious pecuniary difficulties, he sold his commission, and, struggling with adverse fortune, succumbed, and died of decline, leaving 'two helpless girls' to the care of his friend Wilks. During his last illness, he wrote the best of his plays, *The Beaux Stratagem*—in six weeks, it is said—and died while its wit and invention were making the town roar with delight.

F. is one of the finest of comic dramatists, though Pope calls him a 'farce writer.' He is less icily brilliant than Congreve, and has on the whole more variety and character than any of his compeers. He had wit in abundance, but he had humanity too. He was tender-hearted and somewhat melancholy, and—what was rare in his school and in his time—*tears* are found glittering among the brilliants of his fancy.

FARR, *fâr,* WILLIAM, M.D., F.R.S.: 1807, Nov. 30—1883, Apr. 14; b. Kenley, in Shropshire, England: statistician. He became an asst.-surgeon at the Salop Infirmary 1826, and after attending privately the medical and scientific classes of the day, went to Paris Univ. 1829, where he attended the lectures of the most eminent medical professors. In 1831, he returned to England, and became a member of the Univ. of London, where he completed his professional curriculum. F. applied himself mainly to a consideration of the important questions resulting from medical statistics. At first he found it very difficult to draw the attention either of the public or of medical societies to the subject; but in 1837, his article, 'Vital Statistics,' in M'Culloch's *Statistics of the British Empire,* obtained notice and approval. In the same year, the registration of all the deaths, and of the causes of death, was begun in England, and 1838, F. received an appointment in the gen. registrar's office. He was made supt. of a department which draws up the *London Tables of Mortality,* the *Quarterly Returns of Births, Deaths, and Marriages,* and the *Annual Abstracts.* In 1851, 61, and 71, he was engaged on the census. In 1872 he was chosen a corresponding member of the French Institute. In 1880, on the appointment of a new registrar-gen., F. (who was a C. B.) withdrew from the public service. He wrote a *Statistical Nosology*, and valuable papers on Life Assurance, the Income Tax, etc. His *Vital Statistics,* a memorial volume appeared 1885.

FARRAGO, n. *făr-rā'gō* [L. *farrāgō*, mixed food for cattle—from *far*, meal or flour]: a mixture of meal and other food for cattle; a confused mixture; a medley.

FARRAGUT, *făr'a-gŭt*, DAVID GLASCOE: first admiral, U. S. navy: 1801, July 5—1870, Aug. 14; b. Campbell's Station, Tenn.; son of a Spaniard who had served as officer on an American vessel in the Revolution. He was appointed midshipman in the navy and ordered to the *Essex* under Capt. Porter 1810, Dec. 10; had his first war experience when 12 years old, when as prize master he took a captured vessel to Valparaiso, and performed his first battle service in the engagement of the *Essex* with the *Phœbe* and *Cherub* in Valparaiso harbor, 1814, Mar. 28. He was commissioned lieut. 1825, commander 1841, capt. 1855. In 1861, Apr., he volunteered for active service, but it was not till the following year that he was congenially employed. In 1862, Jan., the govt. fitted out an expedition for the capture of New Orleans, placed him in command of the naval fleet, and assigned a force of 15,000 men under Gen. B. F. Butler to co-operate with him. Choosing the sloop-of-war *Hartford* for his flagship, he sailed from Hampton Roads Feb. 2 for Ship Island, 100 m. n. e. of the mouth of the Mississippi, and there awaited the land force which left Fortress Monroe in transports Feb. 20. New Orleans was then defended against attack from the Gulf by Forts Jackson and St. Philip, 70 m. below the city, and by numerous gunboats, steam-rams, and fire-rafts. F. began bombarding Fort Jackson, Apr. 18, and, seeing no prospect of reducing it after a heavy fire of 6 hours, determined to attempt to reach the city by sailing past the two forts in the darkness. Shortly before daylight on Apr. 24, he ordered a general advance of the fleet. Both forts, the gunboats, and the iron-clad ram *Manassas* opened fire upon his vessels as they sped up the river, and the fire-rafts were ignited and directed down stream to oppose the advance. Of the fleet of 17 vessels, 13 passed the forts safely and destroyed the Confederate gunboats above as well as the *Manassas.* The *Brooklyn* silenced Fort St. Philip in passing. The action lasted 1½ hours, and caused a Union loss of 36 killed and 135 wounded. The city was occupied on the 24th, the forts surrendered to Com. Porter 28th, and F. turned over the command of the city to Gen. Butler upon his arrival with the army May 1. F. then desired to attack Mobile the same way, but the govt., anxious to open the Mississippi river its entire length, ordered him to co-operate with Gen. Grant in the campaign against Vicksburg. On June 28 he ran past the fortifications at that point, joined the Union iron-clad fleet above, and finding no army support at hand, repassed

Vicksburg and returned to New Orleans. In these movements he was under fire 2 hours and lost 15 killed and 30 wounded. He was commissioned rear-admiral 1862, July 16. On 1863, Mar. 14, he attempted to send a fleet of 3 sloops-of-war and 3 gunboats lashed together and a side-wheel steamer past the Port Hudson batteries, but only one pair of vessels, the flagship and its consort, got through the fearful fire. On May 24 the combined naval fleets under F., with the army under Gen. Grant, began operations against Port Hudson, and after its fall, July 9, F. sailed in his famous flagship for New York, where he rested 5 months while the vessel was undergoing repairs. In 1864, Jan., he returned to the Gulf, and began planning his long cherished attack on Mobile. On Aug. 5, with a fleet of 14 wooden vessels and gunboats and 4 iron-clad monitors, he passed Forts Morgan and Gaines as he had Forts Jackson and St. Philip, though with greater obstructions from submerged chains and torpedoes, and took possession of the bay, with a loss of 52 killed and 113 drowned. Fort Powell was blown up the next day, Forts Morgan and Gaines surrendered to the army a few days later, but the city was not occupied till 1865, Apr. 12, F. then returned home to recuperate his health. Congress created and gave him the grade of vice-admiral, 1864, Dec.; and created for him that of admiral, 1864, July 25; citizens of New York presented him a purse of $50,000; and swords of honor. public receptions, and banquets were freely tendered him. In 1867 he took command of the European squadron and made a notable cruise; in 1870, Jan., performed his last naval service as commander of the fleet which received the remains of George Peabody in Portland harbor, Me. F. has a place among the most brilliant naval commanders. He was as modest as he was brave.

FARRAKHÁBÁD: see FURRUCKABAD.

FARRANT, a. *făr'rănt:* in *Scot.*, sagacious. **FAR'RAND**, a. in *OE.*, deep; cunning.

FARRANT, *făr'ant*, RICHARD: abt. 1530–81: composer of English church music. He was a gentleman of the Chapel Royal in the reign of Edward VI., and resigned on becoming master of the children of St. George's Chapel, Windsor, 1564. In 1568 he presented a play before the queen at Shrovetide, and on Christmas, 1569, was reappointed to the Chapel Royal, and later became a clerk and organist of St. George's Chapel. His compositions include *Call to Remembrance, Hide Not Thou Thy Face,* and according to some authorities, *Lord, for Thy Tender Mercies' Sake.*

FARRAR, *făr'ėr*, FREDERIC WILLIAM, D.D., F.R.S., Archdeacon of Westminster, England: b. Bombay, India, 1831, Aug. 7. He was educated at King William's College, Isle of Man, and King's College, London, and graduated at the Univ. of London 1850 and at Cambridge Univ. 1854. While a student he gained the chancellor's prize for English verse by his poem on *The Arctic Regions,* and Le Bas classical prize, and also became Norrisian prizeman. He was ordained deacon in the Established Church 1854, and admitted into priest's orders 1857; was appointed asst.-master at Harrow 1855; and was head master of Marlborough College 1871, Jan.—1876, Apr. In 1868, 74, 75, he was a select preacher before Cambridge Univ.; 1870 he preached the Hulsean lectures; 1869–73 was honorary chaplain to the queen; 1873 was appointed one of her chaplains in ordinary; 1876 became a canon of Westminster Abbey and rector of St. Margaret's; and 1883, Apr. 24, was appointed Archdeacon of Westminster. He was appointed Bampton lecturer before Oxford Univ., 1885, and the same year delivered a eulogy on Gen. Grant in the Abbey Aug. 4, and began a lecturing tour of the United States, Oct. F. has contributed to Smith's *Dictionary of the Bible*, Kitto's *Biblical Cyclopædia*, and the *Encyclopædia Britannica*; and published among numerous works *Eric* (1858); *Julian Home* (1859); *St. Winifred's* (1863); *The Origin of Language* (1860); *Chapters on Language* (1865); *Greek Grammar Rules* (1865); *Greek Syntax* (1867); *Families of Speech* (1870); *Language and Languages* (1878); *Seekers after God* (1869); *The Witness of History to Christ* (1871); *The Silence and Voices of God* (1873); *The Life of Christ*, 2 vols. (1874) an exceedingly interesting and popular work; *Life and Works of St. Paul*, 2 vols. (1879); and *The Early Days of Christianity*, 2 vols. (1882); *Eternal Hope*, a fervent and glowing treatise on eschatology, which has met some adverse criticism from adherents of the old doctrines as enfeebling the doctrine of eternal retribution. D. 1903.

FARRAR, JOHN, LL.D.: 1779, July 1—1853, May 8; b. Lincoln, Mass.: mathematician. He graduated at Harvard Univ. 1803, studied theol. in Andover Seminary, became Greek tutor at Harvard 1805 and Hollis prof. of mathematics and natural philosophy 1807, and held the latter chair till 1836. In 1818 he translated La Croix's *Elements of Algebra*, which at once became a text-book in the chief educational institutions of the country; and followed it with selections from Legendre, Biot, Bezant, and other mathematicians.—His second wife, ELIZA WARE F. (1791–1870, Apr. 22; b. Flanders, Europe, dau. of Benjamin Rotch, New Bedford, Mass.), wrote *Children's Robinson Crusoe, The Story of Lafayette, The Story of Howard, Youth's Love Letters, Young Lady's Friend, Congo in Search of His Master*, and *Recollections of Seventy Years.*

FARRAR, TIMOTHY, LL.D.: 1747, July 11—1849, Feb. 21; b. Concord, Mass.: lawyer. He graduated at Harvard Univ. 1767; removed to New Ipswich, N. H., and taught school 1770; served in the revolutionary war and attained the rank of maj.; was appointed a justice of the N. H. court of common pleas after the war; became chief justice 1802, Feb.; and served altogether as judge over 40 years.—His son, TIMOTHY F., was law-partner of Daniel Webster, judge of the N. H. court of common pleas, and author of several legal works and reports.

FARREN, *făr'ĕn*, ELIZA, Countess of Derby: 1759–1829, Apr. 23; b. Liverpool: actress. She was daughter of an

Irish surgeon who became an actor; made her first appearance on the stage at Liverpool 1773, and at London 1777, and married the 12th earl of Derby, 1797, May 1. She was a graceful actress, and a woman of rare beauty and estimable character.

FARRIER, n. *făr'rĭ-ėr* [It. *ferrārĭă*, a smithy: F. *ferrer*, to shoe a horse: L. *ferrārĭŭs*, pert. to iron—from *ferrum*, iron]: a shoer of horses; a horse doctor. Some of the better class of farriers are men of shrewdness and observation, and sometimes considerable experience. Their management of sick horses is occasionally sensible, but generally quite empirical. They have usually but crude ideas of the structure, functions, or diseases of animals, and pin their faith mainly on a few carefully cherished recipes. To their calling as horse-doctors and shoeing smiths (see HORSE-SHOEING), they usually unite those of cow-leech and cutter of colts and pigs. Though still found in some rural districts, especially in England and Ireland, their practice is passing into the hands of regularly educated veterinarians: see VETERINARY MEDICINE. FAR'RIERY, n. *-ėr-ĭ*, the place of business of a farrier; the trade or profession. ARMY-FARRIERS (Farriers-major, and farriers) non-commissioned officers in the cavalry, artillery, engineers, and military train, whose duty it is to shoe the horses of their corps, and, generally, to assist the veterinary surgeon in proper care over the regimental animals. They receive the same pay as other sergeants (with whom they rank); and, in addition, certain allowances proportionate to the number of animals in charge.

FARROW, n. *făr'rō* [AS. *fearh*, a little pig: O.H.G. *farah*, a pig: Sw. *farre*, a boar: Dan. *fare*, to farrow]: a litter of pigs: V. to bring forth pigs. FAR'ROWING, imp. FAR'ROWED, pp. *-rōd*. FARROW, a. [D. *vaarkoe*, *vaars*, a heifer or young cow that has not yet brought forth a calf]: applied to cows not bearing young in a given year or season.

FARS, *fârs*, or FARSISTAN, *fâr-sĭs-tân'*, (anc. *Persis*): province of Persia, on the e. shore of the Persian Gulf, between lat. 27° 30′ and 31° 30′ n., and between long. 49° 30′ and 55° e. The coast region is flat, with a hot climate; inland, the ground rises 2,000 to 3,000 ft., the climate is cooler, and valleys, remarkable for beauty and fertility, ranging from 15 to 100 m. in length, are numerous. E. of this hilly district the province again becomes flat and sandy; and here is the large salt-lake Bakhtegan. The chief rivers are the Bundemeer (anc. Araxes), the Nabon, and the Tab (anc. Arosis). The province produces tobacco, wine, rice, dates, opium, linen, cotton, silk, cochineal, and roses for the manufacture of attar. It has iron and lead mines, marble and alabastar quarries,,and yields also borax and naphtha. It trades mainly with India. The principal towns are—Shiraz, Jehroom, Darab or Darabgerd, Behbehan or Babahan, and Bushire. N. of Shiraz, about 30 m. lie the ruins of the ancient and splendid city of Persepolis, F. contains also the remains of Shahphur, a city older than the age of Alexander the Great, and the celebrated sculptured rocks, called by the Persians *Naksh-i-Rustam.* A cold winter and heavy floods, 1873, 4, caused great damage to property; nearly one-third of the city of Shiraz was destroyed by the floods.

FARSAN ARCHIPEL'AGO, *fâr-sân':* group of islands in the s. e. of the Red Sea, the chief of which are Farsan Kebeer, 31 m. long. and Farsan Seggeer 18 m.; lat. 16° 30 —17° n., and long. 41° 45'—42° 10' e. They would be valuable for harbors, were it not for the reefs in the vicinity.

FARTHER, a. *fâr'thėr,* or FURTHER, a. *fėr'thėr* [from *far* (see FURTHER)]: comp. of *far;* more distant or remote; longer: AD. more remotely; at or to a greater distance: CONJ. moreover; more than that. Superl. FARTHEST, or FURTHEST. *Note.*—FARTHER is applied to physical distance—FURTHER, refers to the progress of an argument or inference: the older forms are *fer, ferre, ferrer,* the *th* being corruptly inserted.

FARTHING, n. *fâr'thĭng* [AS. *feorthling,* the fourth part of a coin—from *feorth,* fourth]: a small copper coin, the fourth part of a penny (q.v.).

FARTHINGALE, n. *fâr'thĭng-gāl* [old form of the word, found in Bp. Latimer; OF. *vertugade* and *verdugalle;* Sp. *verdugado,* a hooped petticoat—from Sp. *verdugo,* a rod or shoot of a tree]: a circle of whalebone formerly in use to spread a woman's petticoat to a wide circumference; a crinoline petticoat: see CRINOLINE.

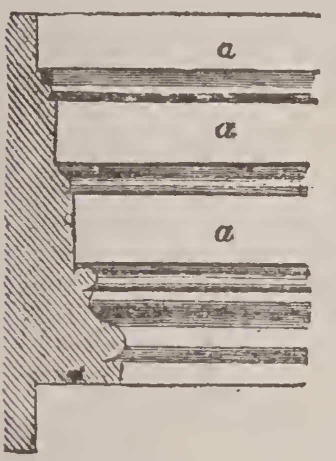
FAR'YNDON INN: name formerly borne by Serjeants' Inn, Chancery Lane. This building belonged to the bishops of Ely, by whom, 1411, it was let to the serjeants-at-law. In 1484, the name was changed to Serjeants' Inn (q.v.).

FASANO, *fâ-sâ'nō:* town of Italy, province of Bari, 33 m. s. e. of the town of Bari; on the high road from that town to Brindisi. It is small, but wealthy. The whole of the district of F. abounds in olive plantations, and there are numerous oil presses in the town and neighborhood. Pop. about 18,500.

FASCES, n. plu. *făs'sēz* [L. *fascēs,* a bundle of rods: It. *fascio*]: bundles of rods usually of birch, sometimes of elm, with an ax projecting from the middle of them, which were carried before the chief magistrates of anc. Rome, as symbols of their power over life and limb. They were borne by the lictors, at first before the kings; in the time of the republic, before consuls and pretors; and afterward before the emperors. Their number varied, a consul having twelve, and a pretor, six; but within the city only two. Valerius Publicola introduced a law that within the city the ax was withdrawn, except in the case of a dictator, who was preceded by twenty-four lictors, bearing as many fasces. Publicola also caused the fasces to be lowered at the assemblies of the people, as an acknowledgment of their supreme power. FAS'CIAL, a. *-sĭ-ăl,* pert. to the fasces.

FASCET, n. *făs'ĕt* [L. *fascis*, a bundle]: in *glass-working*, iron-wire basket on the end of a rod, to carry the bottle from the blowing-rod or the mold to the leer; called also a pontee.

FASCIA, n. *făsh'ĭ ă*, Fas'ciæ, n. plu. *-ĭ-ē* [L. *făscĭă*, bandage, a swathe; *fascĭcŭlŭs*, a small bundle: It. *fascicolo* F. *fascicule*]: in *arch.*, a flat space or band, like a broad ribbon, usually between moldings on the architrave. Architraves are called single, double, or triple fasciæ architraves, according to the number of fasciæ into which they are divided. Also, a fillet; a surgical bandage; in *anat*, a membranous expansion of connective tissue. Fascialis, n. *făs-sĭ ā'lĭs* or *făsh-ĭ-ā'lĭs*, in *anat.*, long, small, and flattened muscle at the anterior part of the thigh; called also sartorius. Fasciated, a. *făsh'ĭ-ā-tĕd*, bound with a bandage. Fas'cia'tion, n. *-ā'shŭn*, in *bot.*, the union of branches or stems, presenting a flattened ribbon-like form; in *anat.*, act or manner of binding diseased parts. Fascicle, n. *făs'sĭ-kl*, a little bunch; a cluster; in *anat.*, a bundle of muscular fibres. Fascicled, a. *făs'sĭ-kld*, or Fasciculate, a. *fă-sĭk ū-lāt*, in *bot.*, collected, as it were, into a little bundle. Fascic'ular, a. *-ū-lėr*, united or growing together in bundles or tufts. Fascicularia, n. *făs-sĭk-ū-lār'ĭ-a*, in *zool.*, a genus of fossil polyzoa, occurring in the Tertiary rocks.

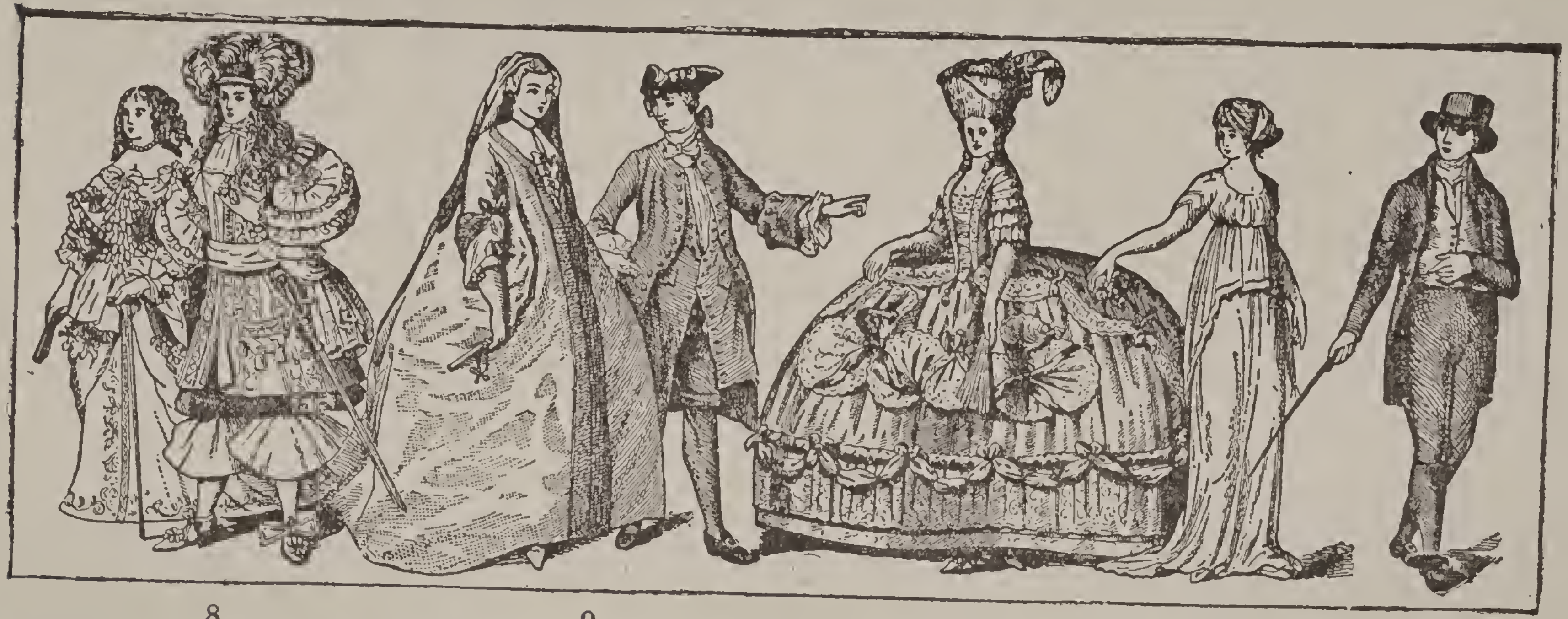


Fascia.

FASCINATE, v. *făs'sĭ nāt* [L. *fascĭnātus*, enchanted, bewitched: F. *fasciner*, to fascinate: comp. Gr. *baskainein*, to bewitch; Gael. *faisniche*, a prophet]: to enchant; to charm; to captivate; to allure by some powerful influence. Fas'cinating, imp.: Adj. charming; enchanting. Fas'cinated, pp. Fas'cina'tion, n. *-nā'shŭn* [F.—L.]: the act of captivating; a powerful influence over the affections or passions; an unseen and inexplicable influence.—Syn. of 'fascinate': to enrapture; enslave; bewitch.

FASCINATION BY SERPENTS: power long popularly ascribed to serpents, at least to some kinds of them, of fascinating by their eye the small animals on which they prey, so as to prevent the escape of the intended victim, when its escape would otherwise be easy, and to cause it rather to run or flutter into the mouth which is open to devour it. This popular notion has been ridiculed, but is supported by a large amount of evidence, and has been fully adopted by some most scientific observers. In the earlier part of last century, Kalm described the rattlesnake as frequently lying at the bottom of a tree, on which a squirrel is seated, and fixing its eyes on the little animal, which from that moment cannot escape, but begins a doleful outcry, comes toward the snake, runs a little away, comes nearer, and finally is swallowed. Le Vaillant describes a similar scene, witnessed by him in Africa, a shrike incapable of moving

PLATE 13.



Fashion.—8, Louis XIV. and his Queen (1670); 9, (1740); 10, Prussian court-dress (1780); 11, A la Grecque (1800); 12, (1804).

away from a serpent which was gazing fixedly at it, and dying of fear, though the serpent was killed. Dr. Andrew Smith states that the presence of a non-venomous s. African tree-snake, *Bucephalus viridis*, in a tree, causes the birds of the neighborhood to collect around it and fly to and fro, uttering piercing cries, 'until some one, more terror-struck than the rest, actually scans its lips, and almost without resistance, becomes a meal for its enemy.' He adds, 'whatever may be said in ridicule of fascination, it is nevertheless true that birds, and even quadrupeds, are, under certain circumstances, unable to retire from the presence of certain of their enemies; and what is even more extraordinary, unable to resist the propensity to advance from a situation of actual safety, into one of most imminent danger. This I have often seen exemplified in the case of birds and snakes; and I have heard of instances equally curious, in which antelopes and other quadrupeds have been so bewildered by the sudden appearance of crocodiles, and by the grimaces and contortions they practiced, as to be unable to fly, or even move from the spot toward which they were approaching to seize them.' Ellis, in his *Three Visits to Madagascar*, records anecdotes of the same kind; one in particular, of a frog apparently unable to move, until an object was pushed between it and the eye of the snake, when the frog immediately darted away, as if relieved from some mesmeric influence.

FASCINE, n. *făs-sēn'* or *făs'sēn* [F. *fascine*, a hurdle, a fascine—from mid. L. *fascīna*, a bundle of wood]: fagots for military purposes, made of young branches of trees or brushwood, also of osiers, bound together with yarn or withes. They are about 12 inches in diameter, and of various lengths, averaging 12 ft., according to the object for which they are intended. Fascines are used in the construction of temporary works, to make earth stand at a slope steeper than it would assume naturally; for filling a ditch, and sometimes, in a pile, for setting fire to an obstruction. Before a siege, the soldiers are employed in making fascines in great number; and when needed, each soldier bears one to the place, casts it on the heap, and the quantity required is thus accumulated in a remarkably short time.

FASCIOLA, *făs-sĭ-ō'la:* generic name formerly denoting all the *Trematode Entozoa*, as Flukes, etc., which are now divided into many genera.

FASCIOLARIA, n. *făs-sĭ-o-lär'ĭ-a* [L. *fasciola*, a bandage]: in *zool.*, genus of gasteropodous mollusks, belonging to the family *Muricidæ.* They occur in warm and southern seas; in *paleon.*, fasciolaria commence their existence in the Cretaceous rocks.

FASH, v. *făsh* [OF. *fascher;* F. *fâcher*, to vex, to tease]: *Scot.*, to trouble; to vex; to tease: N. trouble; vexation. FASH'EOUS, a. *-us*, troublesome. FASH'ING, imp. FASHED, pp. *făsht.* TO FASH ONE'S THUMB, to give one's self trouble, said to be in allusion to the use of the thumb in making a bargain.

FASHION, n. *făsh'ŭn* [F. *façon*, the form or make of a thing: OF. *faceon*, form, shape—from L. *factĭōnem*, a making or doing: comp. Gael. *fasan*, the fashion]: the make or form of anything; the prevailing mode or form of dress; the mode or style usual among persons of good breeding; custom; general practice; in *OE.*, a spelling for Farcy, which see: V. to mold; to shape; to make; to form; in *OE.*, to counterfeit. Fash'ioning, imp. Fash'ioned, pp. *-ŭnd*. Fash'ioner, n. one who. Fash'ionable, a. *-ŭn ă-bl*, according to the established mode; prevailing at a particular time; dressing or behaving according to the usages of good society; well-bred. Fash'ionableness, n. *-bl-nĕs*. Fash'ionably, ad. *-ă-blĭ*. Fash'ionables, n. plu. *-ă-blz*, persons of fashion. Fashion-monger, *-mŭng-gėr* [see Monger]: in *OE.*, one who makes fashions an engrossing study.—Syn. of 'fashion, n.': manner; method; practice; habit; usage; make; form; style; shape; appearance; mode; pattern; model; workmanship; execution; sort; way;—'fashion, v.': to figure; fit; adapt; accommodate.

FASHION, in clothing, or, as the French term it, *La Mode:* prevailing style of dress. It admits as little of exact definition as of being referred to any intelligible principle. In every age and country, there has been a recognizable costume or general style of male and female attire, with certain niceties in the shape, color, and texture of dress, which, fluctuating according to taste or whim, are known as the fashion—a word which etymologically signifies making in a particular form. The terms fashion and fashionable are, however, so comprehensive as to include much beyond the sphere of the toilet; as, for example, a style of speaking, living, and forming opinions; there being, to use a common phrase, 'a fashion in everything.' It is only in China and some other eastern countries that, in consequence of dress being regulated by sumptuary laws or equally strict traditions, the fashions of attire remain from generation to generation with little or no change. (For the nature and necessity of clothing, see Weaving: Sanitary Science).

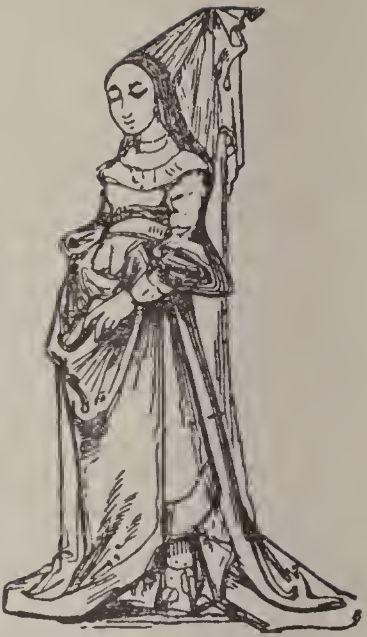
A glance at the leading forms of dress and more conspicuous fashions that have prevailed in W. Europe, particularly in England, since the dawn of civilization, shows that modern costume seemingly had a double origin—that of the Romans and of the Teutonic people, who in different branches invaded France and Britain. The usual Roman dress, in the latter period of the Empire, consisted of a tunic, or loose upper garment, with a dress for the lower limbs, called *braccæ;* hence the modern term *breeches.* Over all was occasionally worn by the higher classes the *toga*, or mantle. It is believed that these Roman costumes were generally copied by the greater number of British, at least among the more opulent classes. In the dress of the women, however, there was but little change. They appear in two tunics, the one reaching to the ankles, the other having short sleeves, and reaching about half-way down the thigh: in other words, they resemble a round gown, or bedgown and petticoat, though the latter, distinct from a body and sleeves, is not considered ancient. This tunic was called in British *gwn*; hence our word *gown*, of which specimens of short dimensions are still worn by women of the humbler classes in England, Scotland, and Wales.

The Anglo-Saxon and Danish periods of English history are marked by new peculiarities in costume. Soon after the departure of the Romans, and the arrival of the Saxons in the 5th c., fashions of apparel were introduced from N. Germany, which continued with no material change for several centuries. The most important improvement in the ordinary dress of the people was the introduction of the *shirt*, a linen garment worn next the skin, for which we are indebted to the Saxon invaders. The common dress of the 8th c. consisted, as we find, of linen shirts; tunics, or a kind of surcoat; cloaks fastened on the breast or shoulders with brooches; short drawers met by hose, over which were worn bands of cloth, linen, or leather, in diagonal crossings. Leathern sandals were worn by the early Anglo-Saxons; but afterward the shoe became common: it was very simple, and well contrived for comfort, being opened down the instep, and there, by a thong passed through holes on each side of the slit, drawn tight round the feet like a purse. A felt or woolen cap, called *hæt* (hence our modern word *hat*), was worn by the higher class of Anglo-Saxons; but it is generally believed that the serfs or lower orders were without any other covering for the head than what nature had given them. The Anglo-Saxon tunic still exists in the *smock-frock*, a species of overall worn generally by the peasantry and some farmers in England, and more rarely in the United States. The *blouse*, worn by workmen in France and Switzerland, has an equally early origin.

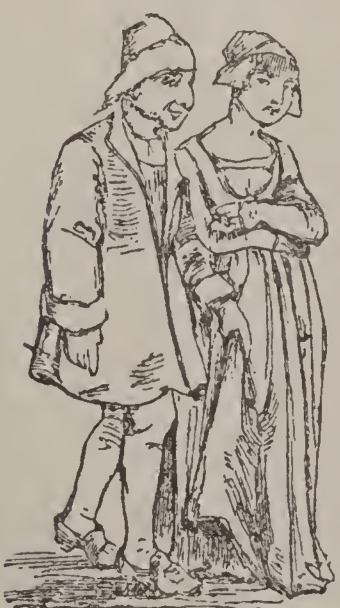
The Norman Conquest brought greater taste and splendor into British costume. Now were introduced gloves (q.v.), with the fashions of chivalry. The annexed engraving represents a gentleman of the reign of Henry V.: he is dressed in a short tunic, buttoned in front, with girdle, large loose sleeves, tight hose forming pantaloons, and stockings in a single piece, peaked shoes, and head-cloth or cap. About this period, silks, and velvets of divers colors came into use among the higher classes, by whom gold chains were generallly worn. The dress of ladies was of the richest kind. Gowns were embroidered and bordered with furs or velvets; and the bodice, laced in front over a stomacher, now first appeared. But the greatest eccentricity was the lofty steeple head-dress, shown in the annexed portrait; this consisted of a roll of linen, covered with fine lawn, which hung to the ground, or was mostly tucked under the arms.

Gentleman of Fifteenth Century.

In the 16th c., the upper part of the long hose or nether garments began to be worn loose, or slashed with pieces of different colors let in, and the arms and shoulders of the doublet or jacket were fashioned in a similar style. Boots also were worn loose on the leg, with the upper part falling down; hence the origin of the *buskin*. Ruffs or ruffles, collars, and vetvet bonnets with feathers, likewise came into use, as may be seen from the paintings of Henry VIII. Hall, the chronicler, describes several of Henry's superb dresses, and among them a *frocke*, or coat of velvet, embroidered all over with gold of damask, the sleeves and breast cut and lined with cloth of gold, and tied together 'with great buttons of diamonds, rubies, and orient pearls.' The cloaks and mantles were of corresponding magnificence. The shirts were pinched or plaited, and embroidered with gold, silver, or silk. The term *hose* continued to be applied to the entire vestment, from the waist to the feet, throughout this century: the material is more distinctly stated, for Henry wore knit silk as well as cloth hose: the precise period of the separation of the hose into breeches and stockings, is not so clear as the derivation of the latter term from the '*stockying* of hose;' 'that is, adding the lower part that covered the legs and feet to that which was fastened by points to the doublet,' and was called the *stocks*. The shoes and buskins were of the German fashion, very broad at the toes, and of velvet and satin, slashed and puffed. The hats, caps, and bonnets were of almost endless forms and colors.


Lady of the Fifteenth Century.

The dress of the middle ranks in the reign of Henry VIII. may be seen in prints of the time; plain russet coats, and a loose kind of kersey breeches, with stockings of the same piece, were the ordinary suit; and the London apprentices wore blue cloaks in summer, and gowns of the same color in winter, as badges of servitude: for this appears to have been the age of domestic distinctions—the relics of the feudalism of the middle ages. The women wore russet, or long woolen gowns, worsted kirtles (hereafter called *petticoats*), and white caps, and aprons; and white under-linen came into general wear. The engraving shows a man and woman in the ordinary dress of this period.


Man and Woman of the Sixteenth Century.

The principal novelty of the reign

of Edward VI. and Mary was the flat round bonnet or cap, of plain velvet or cloth, worn on one side of the head, and decorated with a jewel and single ostrich feather. The bonnet itself is preserved in the caps worn at the present day by the boys of Christ's Hospital; and their blue coat and yellow stockings are such as were worn by the London apprentices at the date of the foundation of the hospital by the youthful Edward. See HOSIERY.

The male costume in Elizabeth's reign was the large trunk hose, long-waisted doublet, short cloak, hat, band, and feather, shoes with roses, and the large ruff; but the great breeches, 'stuffed with hair-like woolsacks,' after the separation of the hose into this garment and stockings, appear to have been worn throughout the reign; they were made of silk, velvet, satin, and damask. The doublets were still more costly, and quilted and stuffed, 'slashed, jagged, pinched, and laced;' and over these were worn coats and jerkins in as many varieties as there are days in the year. The cloaks were of the Spanish, French, and Dutch cuts, of cloth, silk, velvet, and taffeta of all colors, trimmed with gold, silver, and silk-lace and glass bugles, inside and outside equally superb. The stockings, shoes, slippers, and ruffs resembled those of the ladies. *Hats* now began to supersede the bonnets of a former era. Those of beaver were exceedingly expensive, and they were for the most part made of felted wool, dyed. The most remarkable thing about these hats was their numerous shapes; some were steeple-crowned; others were flat and broad, like the battlements of a house; and others with round crowns, and bands of all colors, and ornamented with huge feathers and brooches, clasps, and jewels of great value. See HAT.

As regards female attire, the more conspicuous features in the reign of Elizabeth were the farthingale (q.v.) and ruff. The farthingale, or fardingale, consisted in an extravagant expansion of the lower garments, by means of cane or whalebone, by which the lady seemed to walk in a kind of inverted tub. The farthingale, referred to by Shakespeare, Butler, and other writers, mostly in a satiric vein, was the predecessor of the hoop, which in its turn, after an interval, was succeeded by the Crinoline (q.v.) and hoop-work of steel. The widely extended ruff of fine linen, like a huge frill, is seen in the pictures of Elizabeth and her envied rival, Mary Queen of Scots, both stars of fashion in their day.

Under James I., the male costume was somewhat more Spanish, as respects the slashing and ornamenting of the doublet and breeches. Late in the reign, however, the jackets or doublets were shortened, and the breeches reduced in size, and fastened in large bows at the knees ; the well-stockinged leg was admired, and the hat worn low in the crown, and with broad brim, as seen in portraits of date 1619. Beards and whiskers had become almost universal in the reign of Elizabeth ; but in that of James, the former was sometimes worn trimmed to a point, hanging down at the division of the ruff.

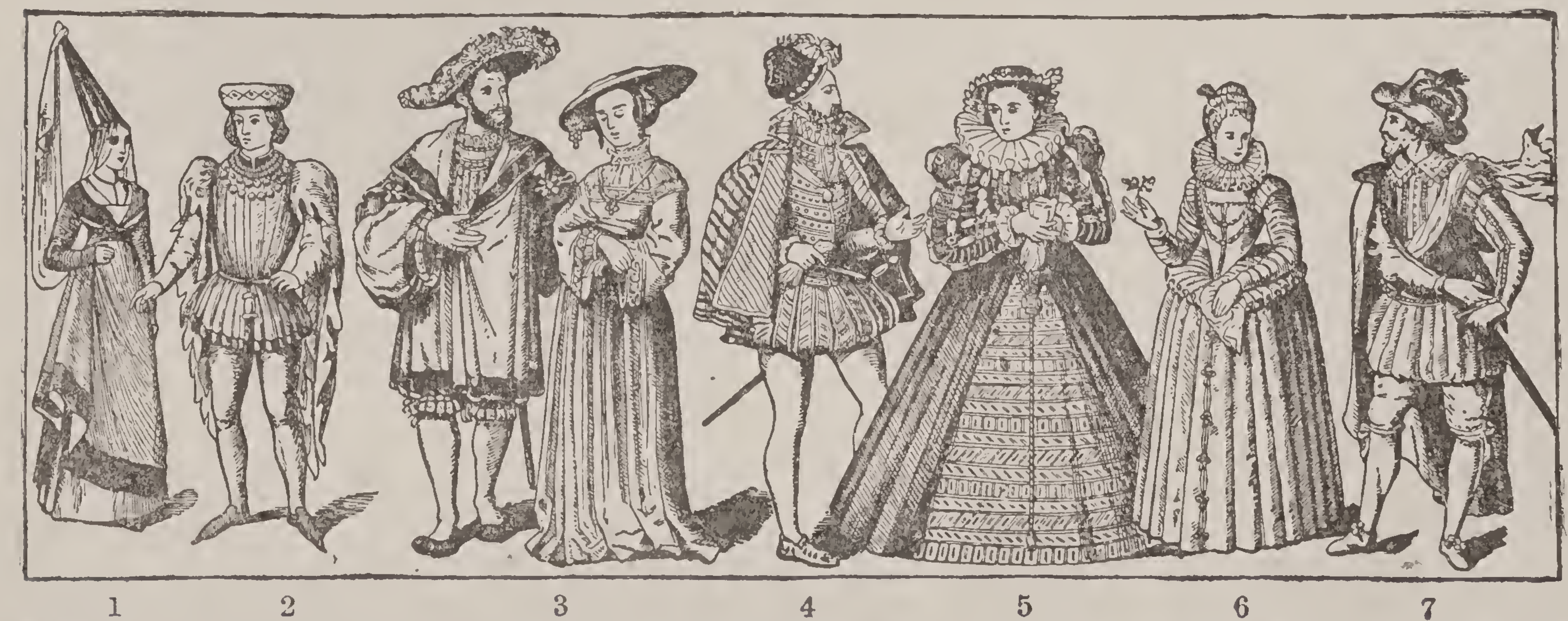
In the female costume, there was little change. The farthingale continued to be worn by ladies of quality; a strong passion for foreign lace was introduced; pearls were the favorite jewels; and the ruff maintained its sway, so as to be anathematized from the pulpit: and the fancies of female costume were glanced at in a sermon preached before the king at Whitehall 1607—8, as 'her French, her Spanish, and her foolish fashions.'

The fashion of dress in the reign of Charles I. became still more decidely Spanish and picturesque. There were now worn collars of rich point-lace, large and hanging down on the shoulders, held by a cord and tassel at the neck, and now called *Vandyke,* from its being the most striking part of the dress in which Vandyke at that time painted portraits. The principal habits were vests and cloaks of velvet, or silk damask, short-trousered breeches terminating in stuffed roles, and fringes and points, and very rich boots, with large projecting lace tops. A dress of Charles I. is thus described: A falling band, green doublet (from the armpits to the shoulders wide and loose), zigzag turned-up ruffles, long green breeches (like a Dutchman's), tied below the knee with yellow ribbons, red stockings, green shoe-roses, and a short red cloak lined with blue, with a star on the shoulder; the king sometimes wore a large cravat, and at other times a long falling band with tassels. The dress of the gay courtiers or cavaliers consisted of a doublet of velvet, silk, or satin, with large loose sleeves, slashed, and embroidered; Vandyke collar and band, and short embroidered cloak, worn on one shoulder; the long breeches, fringed and pointed, met the ruffled tops of the boots; the embroidered sword-belt was worn over the right shoulder, and in it was hung a Spanish rapier, and in the flapping beaver-hat was worn a plume of feathers confined by a jewel. A buff coat or jerkin was often worn, as a better defense than the doublet, which is sometimes covered. The engraving represents a citizen of this period more plainly attired.

Citizen in the time of Charles I.

The female costume of this period was rather elegant than splendid. Gowns with close bodies and tight sleeves were worn, though the farthingale was retained, with a gorget ruff standing up about the neck like a fan. French hoods were still worn, though with little distinction as to rank. The hair was worn in small curls, and the hoods, of all colors, fastened under the chin with curious effect. Earrings, necklaces, and bracelets, were much worn; but the Puritan women were expected to forego lace, jewels, or even braided hair; and they retained the close hood and high-crowned hat. Toward the close of the reign

PLATE 12.

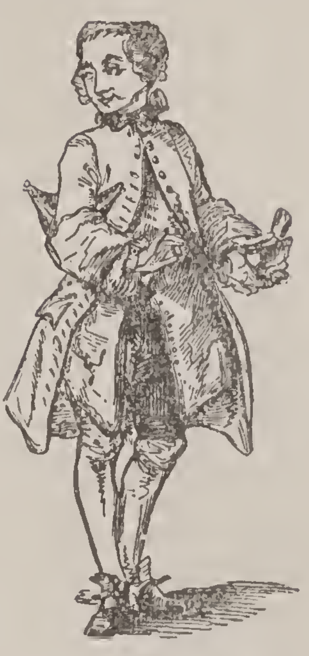


Fashion.—1, Flemish (1341); 2, French (1410); 3, German (1530); 4, Spanish (1580); 5, French (1590); 6, 7, Beginning of seventeenth century.

of Charles I., the cumbrous farthingale disappeared, with the yellow starched ruff and band. These tasteless fashions being dismissed, the female dress became very elegant, with its rich full skirt and sleeves, and falling collar edged with rich lace, and the hair worn in graceful ringlets; but these vanities were condemned by the Puritan party in an extreme reaction from the unbridled extravagance and luxury of the court.

With the restoration of Charles II. came certain tasteless innovations upon the elegant Vandyke costume of the time of Charles I., which were the first resemblance to the coats and waistcoats of the present day. Thus the most picturesque English attire lasted little more than a quarter of a century. Its decline was gradual; its chivalric character soon degenerated into grotesqueness, which in its turn changed to stark meanness. Early in the reign of Charles II., the doublet was much shortened, and worn open in front, where, and at the waistband, the rich shirt was shown; and the loose sleeves and breeches were decked with ribbons and points, and from the knee-bands hung long lace-ruffles. At the wrists, too, ruffles were worn; but the lace-collar was shorn of its points The cloak was retained upon the left shoulder, and the high-crowned and plumed hat remained for a short time; but the crown of the hat was soon lowered. The petticoat breeches were another absurdity; although ornamented with ribbons at the sides, the lining strangely appeared below the breeches, and was tied at the knees; to match which, the sleeves of the doublet reached only to the elbows, and from under them bulged the ruffled sleeves of the shirt, both ornamented with ribbons. Meanwhile the skirt of the doublet had been lengthened from above the waist nearly to the knees, and had buttons and button-holes in its entire length, thus becoming a *coat*, and so named in an inventory of 1679; wherein also are the items of *waistcoat*, *breeches*, *pantaloons*, *drawers*, and *trousers*, being the earliest mention of these articles. Stockings of various kinds were common; and 'the lower ends of stockings' are understood as socks. Instead of the lace-collar was worn the long square-ended cravat, of the same material, from Brussels, and Flanders.

Passing to the reigns of James II. and William III., we find the male attire gradually fashioned according to the artificial costume of the court of Louis XIV. Every article of dress was now more prim and exact. The petticoat breeches were exchanged for the close-fitting garments tied below the knee, and therefore called *knee-breeches;* the broad-brimmed hats were turned up on two sides, and edged with feathers or ribbons; the rich long lace cravat and embroidered waistcoat appeared; and the band was now narrowed, so as to resemble that worn at the present time by clergymen of some denominations. Wigs, which had been some time in use, were worn still longer than hitherto, hanging down in front, or flowing upon the shoulders, though the color was altered from black to suit the complexion. From the 17th to the end of the 18th c. was the era of *Hair-powder* (q.v.), *Wigs* (q.v.), and cocked hats: in these as in other matters there was excessive artificiality in the tastes of the higher classes. In the annexed cut, is a representation of a gentleman of 1750, with his flowing coat and ample cuffs, frills at the wrist, deep waistcoat hanging over the legs, long white hose drawn over the knees, his cocked-hat folded under his arm, and in his hand the open snuff-box (q.v.). Such was the appearance of what is traditionally known as the 'old English gentleman.' The coats of the 18th c. were of velvet, silk, or satin, as well as broadcloth, and their colors very fanciful. Hogarth's favorite color was sky-blue; Reynolds's deep crimson and violet; and Goldsmith rejoiced in plum-color. About 1790, cloth became the general wear; the waistcoat being of the costlier materials, and embroidered, and sometimes the breeches. Buckles were worn at the knees and in the shoes till the close of the century; and the large square plaited buckle was the *ton* until 1791, when shoe strings became general. Among the artificialities of dress during the greater part of the 18th c., none was more odious than that of hoops (q v.), worn by ladies, who, by these means of expansion, were again made to appear as if standing in an inverted tub. In the reigns of George I. and II., a loose kind of drapery at the back of the dress, called a *sacque*, and hooded silk cloaks, were worn, also a very small muff, such as have been lately revived. In the 18 c., after the disuse of towering headdreses veils (q.v.) of an elegant fabric were introduced, and the fan (q.v.) was an important article for ornament and flirtation.



Gentleman of 1750.

The formalities of the 18th c. received a severe blow at the French Revolution; and in the ten years, 1790–1800, a more complete change was effected in dress, by the spontaneous action of the people, than had taken place at any previous period in a century. The change began in France, partly to mark a contempt for old court usages, and partly in imitation of certain classes of persons in England, whose costume the French mistook for that of the nation generally. This new French dress was introduced by the party who were styled the Sans Culottes. It consisted of a round hat, a short coat, a light waistcoat, and pantaloons; a handkerchief was tied loosely round the neck, with the end; long and hanging down, and showing the shirt-collar aboves the hair, was cut short, without powder, *à la Titus*, and the shoes were tied with strings. The comparatively simple form of dress of the Sans Culottes found many admirers in England, and soon became common among young men; the change from antique fashions was greatly helped also by the imposition of a tax on the use of hair-powder, which was henceforth generally abandoned.

Pantaloons, which fitted closely to the leg, remained in very common use by those persons who had adopted them till 1814, when the wearing of trousers, already introduced into the army, became fashionable. It is proper, however, to mention that trousers had, for the previous 15 or 20 years, been used by boys, and were perhaps from them adopted by the army. Previous to the French Revolution, the dress of boys was almost the same as that of men. Although trousers—improperly called by some Americans *pants*—were generally worn after 1815, many elderly persons still held out in knee-breeches against all innovations, and to the present day an aged gentleman may occasionally be seen clinging to this 18th c. piece of dress. The general use of white neckcloths continued, notwithstanding the introduction of the standing collar, till the reign of George IV., when this monarch's taste for wearing a black silk kerchief or stock, and also the use of black stocks in the army, caused a remarkably quick abandonment of white neckcloths, and the adoption of black instead. The year 1825, or thereabouts, was the era of this signal improvement in costume.

While these leading changes were effecting, other alterations, less conspicuous, were from time to time taking place. The disbanding of the army after the peace of 1815 led to various transformations besides those above mentioned. While pantaloons were the fashionable dress, it became customary to wear Hessian boots; these, which had originated among the Hessian troops, were without 'tops;' and were worn with small silk tassels dangling from a cut in front; being drawn over the lower part of the pantaloons, they had a neat appearance; but the keeping of them clean formed a task that prevented their universal use: see BOOTS. When trousers were introduced from the practice of the army, the use of Wellington boots to go beneath them also became common. Referring to the era 1815–25 as that in which trousers, Wellington boots, and black neckcloths or stocks came into vogue, we may place the introduction of the surtout in the same period. From the time when the collarless and broad-skirted coat had disappeared about the commencement of the century, the fashion of coats had changed in various ways till the above-named era, when the loose frock-coat or surtout was added to the list of garments.

Such is a general account of the progress of fashions in England until nearly the present day. In these fashions, the Welsh, Irish, and Scotch, and in later times the Americans, have participated, and there is now little to distinguish the inhabitants of one of these countries from those of another. For what differences exist in particular localities—as, for instance, the round hats of the women in Wales, the checked gray *plaid* of the Lowland Scottish peasantry, and the *tartan* of the Highlanders—see the respective titles.

The general simplifying of dress subsequent to 1815, was not unaccompanied by an expiring effort to sustain a high style of fashion. The *macaroni*, or highly dressed beau of the 18th c., was now succeeded by the *danay*, who, with mincing, affected manners, prided himself on his starched collars, his trouser-straps, and the flashy bunch of seals which dangled from his watch-chain. The Regency was the era of this kind of supreme dandyism, but it continued till later times, and characterized a number of leading public personages, of whom notices occur in Raikes's *Reminiscences*, 1831–51. In the present day may be noted a kind of break-down of everything like formality in gentlemen's walking costume. Plain cloths, of divers hues, called tweeds (q.v.), have almost superseded materials of a superior quality; cloth caps, or soft felted hats, called *wide-awakes* (see HAT), cover the head, and the feet are provided with short ankle boots instead of Wellingtons. In evening or dinner costume, however, the old etiquette of dress-coats and white neckcloths is maintained. Among the changes that are taking place in the morning dress, or at least that for walking and exercise, none is so remarkable as the growing fashion of wearing *knickerbockers*. These are wide loose trousers to below the knee, leaving the lower part of the leg only stockinged or covered with leggings. This fashion, copied immediately from the French Zouaves (q.v.), and partly perhaps from the common practice of stuffing the lower parts of the trousers roughly into boots in the western regions of the United States, is very much a resumption of the costumes seen in old Dutch prints. Should it become general, leg-gaiters or boots will come again into use, and the present generation may live to see the fashion of male attire work once more round tothe knee-breeches of the 18th c. In female as well as in male costume, fashion seems to have a tendency to work in a circle; of this, the late but now obsolete, resumption of the farthingale, or hoop, under the name of crinoline, offers a sufficient example, besides affording a ludicrous instance of the unreasoning manner in which extravagances in dress are usually followed. It is to be observed, however, that Englishwomen, chargeable with whatever absurdities in dress, set a creditable example to their sex all over the world, in allowing no fantastic change of fashion to prevent them from taking out-door exercise in all weathers, which the introduction of india-rubber goloshes (q.v.) has materially aided.

As to the moral view that may be taken of the whimsicalities of female fashions, we might refer to the numerous papers of Steele in the *Tatler* and *Spectator*, and also to the writings of other 18th c. essayists, passing those over, it is enough to quote the words of Hazlitt, a more recent essayist. 'Fashion,' he says, 'constantly begins and ends in two things it abhors most—singularity and vulgarity. It is the perpetual setting up and then disowning a certain standard of taste, elegance, and refinement, which has no other formation or authority than that it is the prevailing distraction of the moment; which was yesterday ridiculous from its being new, and to-morrow will be odious from its being common. It is one of the most slight and insignificant of all things. It cannot be lasting, for it depends on the constant change and shifting of its own harlequin disguises; it cannot be sterling, for, if it were, it could not depend on the breath of caprice; it must be superficial, to produce its immediate effect on the gaping crowd; and frivolous, to admit of its being assumed at pleasure by the number of those who affect to be in the fashion, to be distinguished from the rest of the world. It is not anything in itself, nor the sign of anything, but the folly and vanity of those who rely upon it as their greatest pride and ornament. It takes the firmest hold of weak, flimsy, and narrow minds, of those whose emptiness conceives of nothing excellent but what is thought so by others. That which is good for anything is the better for being widely diffused. But fashion is the abortive issue of vain ostentation and exclusive egotism: it is haughty, trifling, affected, servile, despotic, mean and ambitious, precise and fantastical, all in a breath—tied to no rule, and bound to conform to every rule of the minute.' For a large variety of amusing particulars concerning fashions, 'stars of fashion,' etc., during the past two centuries, see Mrs. Stone's *Chronicles of Fashion* (Lond. 2 vols. 1845).

FASKIDAR, n. *făs'kĭ-dâr* [etym. doubtful]: in *ornith.*, the Northern Gull, *Larus parasiticus*, now *Lestris cataractes.*

FASQUELLE, *făs-kĕl'*, JEAN LOUIS, F.B., LL.D.: 1808–1862; b. France: educator. He removed to the United States 1834, spent some years in teaching languages, was appointed prof. of modern languages and literature in the Univ. of Mich. 1846, and held the office till death. He published *A New Method of Learning the French Language* (1854); *Télémaque, with Notes and Grammatical References; Colloquial French Reader* (1854); *Napoleon, with Notes;* and *A General and Idiomatical Dictionary of the French and English Languages.* His French text-books had a large sale in the United States and in England.

FASSAITE, n. *făs'sā-īt*, or FAS'SITE [from *Fassathal*, in the Tyrol]: a mineral, a variety of augite.

FAST, a. *făst* [AS. *faest;* Icel. *fastr;* Swed. *fast;* Ger. *feste,* firm, unbroken, rapid in succession: mid. L. *fasté,* immediately: comp. Gael. *fas,* to increase]: close; immovable; firmly fixed; without leaving an interval, as, to follow *fast;* faithful, as a *fast* friend; rapid in motion; quick; speedy; extravagant; dissipated and gay, as a *fast* man; wild: AD. with quick steps; rapidly; firmly. FAST'LY, ad. *-lĭ,* firmly; surely. FAST'NESS, n. *-nĕs* [Ger. *festung,* a place of security]: a stronghold; a place of unbroken defense. FASTEN, v. *făs'n,* to fix firmly; to bolt or bar; to seize and hold on. FASTEN'ING, imp. *făs'nĭng:* N. anything that binds or makes fast. FASTENED, pp. *făs'nd.* FASTENER, n. *făs'nĕr,* he or that which fastens. FAST AND LOOSE, changeable; inconstant (see below). FAST BY, close or near to. IT RAINS FAST, the drops fall close on each other.—SYN. of 'fasten': to fix; stick; link; cement; attach; annex; affix; secure.

FAST, v. *făst* [Goth. *fastan;* Icel, *fasta,* to hold, to keep: Ger. *fassen;* Dut. *vatten,* to seize, to hold: comp. Gael. *fastadh,* to bind one's self, to engage: connected with preceding]: to abstain from food beyond the usual time: N. the abstaining from food for a certain time, or from particular kinds of food as flesh; a religious mortification or humiliation by abstaining from food; the time of abstaining from food. FAST'ING, imp.: N. act of abstaining from food. FAST'ED, pp. FAST'ER, N. one who abstains from food. FAST-DAY, a day set apart for special religious worship and humiliation.—*Fasting* is abstinence from food, either partial, when the restriction is confined to certain articles of food; or total when all sustenance is dispensed with for a specified time. The origin of the custom seems to be coeval with man's first experience of the salutary influence which abstinence exercises on the health, and with his more or less instinctive consciousness of the necessity of retaining the body in due subjection to the soul. By degrees, the self-mortification which it implied raised it into a sacrifice offered to the Deity; it became a religious observance, was surrounded with rites and ceremonies, and finally came to bear the stamp of a divine law. Climate, the habits of a people, and their creed, gave it at different periods different characteristics; but it may be pronounced a recognized institution with all the more civilzied nations, especially those of Asia, through all historic times. It was in high estimation among the ancient Parsees of Irania. It formed a prominent feature in the ceremonies of the Mysteries of Mithras; and found its way, together with these, over Armenia, Cappadocia, Pontus, and Asia Minor, to Palestine, and northward to the wilds of Scythia. The ancient Chinese and Hindus, principally the latter, carried fasting to unnatural excess, in accordance with their primeval view—which they held in common with the Parsees—of heaven and hell, salvation and damnation, of the transmigration of the soul, and of the body as the temporary prison of a fallen spirit. Although the Vedas attach little importance to the excruciation of the body, yet the Pavaka, by the due observance of which the Hindu believer is purified from all his sins, requires among other things an uninterrupted fast for 12 days. Egypt seems to have had few or no compulsory general fasts; but it is established beyond doubt, that for the initiation into the mysteries of Isis and Osiris, temporary abstinence was rigorously enforced. In Siam, all solemn acts are preceded by a period of fasting, the seasons of the new and full moon especially being consecrated to this rite. In Java, where abstinence from the flesh of oxen is part of the religion of all, Buddhists and worshippers of Brahma alike, the manner and times of the observance vary according to the religion of the individual. Again in Thibet, the Dalai-lamaites and Bogdo-lamaites in common hold this law. That Greece observed and gave a high place to occasional fast-days such as the third day of the festival of the Eleusinian mysteries, and that, for instance, those who came to consult the oracle of Trophonius, had to abstain from food for 24 hours—is well known. The Romans did not omit so important an element of the festivals and ceremonies which they adopted from their neighbors, though with them the periods of fasting were of less frequent recurrence. See THESMOPHORIA.

As to the Semitic races, although we find the people of Nineveh undergoing occasional fasts, to which even animals were made to conform, yet the Mosaic law set apart for fasting one day only in the whole year. The 10th day of the seventh month (Tishri), called 'the Day of Atonement' (Yom Kippur), or, as the holiest of the whole year, 'the Sabbath of Sabbaths,' was ordained for 'the chastening of the *Nephesh,*' which the traditional law explains as meaning the strictest and most rigorous abstinence from all food or drink, as also from washing, anointing, the putting on of sandals, etc., from the sunset of the ninth to the rising of three stars on the evening of the tenth day. In process of time, five days of compulsory fasting were added, in commemoration of certain days of humiliation and national misfortune—viz., the 17th of the fourth month (Tamus), as the anniversary of the taking of Jerusalem both by Nebuchadnezzar and Titus; the 3d of the seventh month (Tishri), when Ishmael had killed Gedaliah, the Jewish governor appointed by the Babylonians (Jer. xli. 2); the 10th of the tenth month (Tebeth), in remembrance of the siege of Nebuchadnezzar; the 13th of the twelfth month (Adar), the fast of Esther, and the day most rigorously kept, next to the great Day of Atonement:—the 9th of the fifth month (Ab), anniversary of the destruction of the first temple by Nebuchadnezzar, and of the second by Titus. That the people had at all times been prone to attach great importance to the use of this penance as a visible sign of outward contrition, is clear from that ordinance of the Mosaic law which puts into the hands of the head of a family the power of confining self-imposed vows of abstinence within due limits. The community had a desire to express their penitence for sin, or their grief on the death of great men, by occasional fastings. Fastings were also considered efficient in averting the divine wrath, insuring victory over an enemy, or bringing down rain from heaven.

Besides, fasting was frequently with those who wished to free their minds from all hindrances to meditation, as in the 40 days of Moses (Ex. xxxiv. 28), or the fast of Daniel (Dan. x. 2, 3). This fast of Contemplation, as it might be called, seems also to have been the model imitated by the Cabbalists, some of whom are known to have fasted from Sabbath to Sabbath. In later times, when, after the destruction of the temple, sacrifices had ceased, fasting, as causing a decrease in the flesh and fat of the individual, was considered in some degree a substitute for the animal which had formerly been offered up by the priest. From an aid to repentance and inward purification, which purpose alone it had been originally intended to serve, it became an end and a virtue in itself; an abuse, indeed, neither unknown nor undenounced even in the days of the prophets. If we add to this the endless chain of dire calamities and ever-renewed persecutions of which the Jews have been the victims for many a long century, the ever-increasing number of their fasts commemorative of deaths and tribulations will not be surprising. Most of these, however, which were superadded from time to time, soon fell into oblivion. Besides the six already mentioned, few entire days are now observed by the orthodox, and these merely of local observance. Fasting, with the Jews, always implies entire abstinence, and lasts, except on the Day of Atonement and the 9th of Ab—when the sunset of the previous evening is the sign for its commencement—from the break of the day to the appearance of the first three stars. Sackcloth and ashes, the garb of the penitent in ancient times, are no longer worn; but as the special holiness of the Day of Atonement is celebrated by various solemnities (see FESTIVALS), so the deepest mourning over the loss of temple and country is visibly expressed by many ceremonies in the Jewish synagogues and homes on the 9th of Ab. On that day also, to add individual to national sorrow, the cemeteries are generally visited. Of several half-days of fasting that have survived, are the first two Mondays and the first Thursday in the second month (Iyar) and in the eighth month (Cheshwan), (sheni vachamishi vesheni), in celebration of the two meeting-points of summer and winter; also, several days before the New-year or Day of Judgment, and before the Day of Atonement. The individual is bound to commemorate by fasting the anniversary of the death of his parents, his own wedding-day until the performance of the marriage-ceremony, and the birth of his first-born male child (till its 13th year—when the duty falls upon the child himself), on the day preceding the Pesach (Pasha)—in commemoration of the sparing of the Israelite first-born in Egypt. For the several hours' fasts on the two New-years' Days, and on the first six days of the Feast of Tabernacles, see FESTIVALS. The Sabbath causes the postponement of any fast—that of the Day of Atonement only excepted—which may happen to be coincident with it; and children—girls till their 12th, boys till their 13th year—pregnant women, and the sick, are exempted from the observance

In the time of Christ, fasting, as we have seen was in high estimation. The Mondays and Thursdays—the market-days, on which the judges sat, and the law was read in the synagogues—were especially set aside for this purpose by the Pharisees. The Essenes fasted even more frequently. The Sadducees alone took exception to this rite, and were therefore considered ungodly. Christ himself neither approved nor disapproved of the custom, but, as in all matters of ceremony, allowed his disciples, Jews and Gentiles, to act according or contrary to their old habits. He allows and uses the privilege, but is distinctly against such a *commandment,* and even excuses those who do not fast. His own abstinence from food for 40 days was like that of Moses, entirely an individual act; and against a voluntary and limited imitation of such abstinence, to which the spirit might move a man, no objection whatever was to be taken. Rom. Catholics, however, maintain that all the words of our Lord, which to Protestants appear to discountenance the obligation of fasting, are directed exclusively against the ostentatious and self-reliant fasts of the Pharisees. They even understand the language which he used in condemning the practice of the Pharisee fasters, as containing a direct exhortation to his own disciples—not that they should abstain from fasting—that they should fast with suitable dispositions. They hold, moreover, that in exempting his disciples from fasting, he had regard only to the actual time of his own presence among them. It was incongruous, he said, that the children of the marriage should fast as long as the bridegroom was with them; but he added, 'the days will come when the bridegroom shall be taken away from them; *and then they shall fast in those days'* (Mk. iii. 20; Matt. ix. 15). Hence they infer, that from the time of our Lord's ascension the practice of fasting became obligatory on his disciples, the temporary cause of the exemption hitherto existing having ceased By Protestants it is held that during the first centuries of Christianity, voluntary fasts were frequent; the new converts adhering in most cases to their old rite, only taking care to change the days, which had been days of abstinence in their former religions, for others. Besides, fasts were considered a befitting preparation for holy acts and feasts, for ordination and Baptism. The time mostly observed annually in common by all were the 40 hours from Friday afternoon to Sunday morning, during which time Christ lay in the sepulchre. But not before the end of the 2d c. was anything like an ordinance promulgated with respect to fasting in the new religion. It was first Montanus who, as the pretended Paraclete, introduced, among other laws of excessive rigor, fasting, as an inhibition upon the faithful. The Wednesdays and Fridays, as the days when Christ was taken prisoner and crucified, were made days of strictest abstinence from all food; while on the other days of the week, dried, uncooked victuals only were allowed. Asceticism and monachism had their share in the gradual development of the doctrine of the necessity of mortifying the flesh, and as a natural consequence in the growth and diffusion of the custom of fasting. Yet, in the first six centuries, the difference in the various Christian communities was not greater in any other doctrine or ceremony than in this. Bishops and councils, however, gradually fixed the times and seasons for the whole of Christendom. The 40 hours had gradually become 40 days, called the Quadragesima; and the Council of Orleans, 541, made it binding upon every Christian not to eat any meat during this time, save only on the Sundays. However, here again Rom. Catholics dissent strongly from the Prot. view of this history. They admit that the followers of Montanus did introduce greater rigor and frequency into their fasts; but they deny that before the time of Montanus the practice of fasting was not fully recognized in the Christian Church, and regarded as strictly obligatory; since, as they allege, the very earliest allusions to the 40 days' fast of Lent (*tessaracosté*) regard it as an established and recognized institution. Their claim is that the very first fathers who allude to it, speak of it as 'handed down and observed by the church;' and that so far is its origin from being ascribable to the influence of Montanism, that, on the contrary, the earliest relaxations which the church admitted were a reaction against the excessive and intolerable rigor of that fanatical sect. Returning to the general flow of church-history, we note that the eighth council at Toledo, 7th c., declared those who ate meat during Lent, sinners unworthy to partake in the resurrection. From the 8th c. to the 11th, when a gradual reaction set in, the laws of fasting and the punishments awarded to the transgressors became stricter and stricter; interdict and excommunication were among the penalties. By degrees fasts had become so numerous and different in kind, that they were divided into—1. Jejunium generale (a fast binding for all); 2. Consuetudinarium (local fast, etc.); 3. Penitentiale (atonement for all transgressions); 4. Votivum (consequent upon a vow); 5. Voluntare (for the better carrying out of an undertaking). These, again, were kept as 1. Jejunium naturale (entire abstinence from food or drink, especially in preparation for reception of the Eucharist); 2. Abstinentia (certain food only being allowed, but several times a day); 3. Jejunium cum abstinentia (the same food, but taken only once a day); and 4. Jejunium sine abstinentia (all kinds of food, but only once a day). The food prohibited on partial fast-days included, during certain periods, not only the flesh of quadrupeds, fowl, and fish, but also the 'lacticinia'—i.e., all that comes from quadruped and bird, as butter, eggs, milk, etc. The discrepancies and differences of opinion with respect to the times and modes of fasting, or to the food prohibited, even among successive popes and contemporary bishops and elders of the church, were so numerous, and involved in such obscurities, that the church historians themselves shrink from enumerating them. Suffice it to say, that they gradually developed in the Rom. Church into—1. Weekly fasts, of which Friday, as the day of the crucifixion, seems to have been early and generally observed. To this was added the Wednesday, as the day on which the death of Christ was resolved upon. These two days received the name of Stations; a term borrowed from the *stationes* of the Roman soldiers, in accordance with the views held by the ascetics and monks that they were the warriors of Christ. At a synod in Spain in the beginning of the 4th c., the Saturday was superadded, but this innovation met with great opposition, especially in the East, where Jewish notions regarding the Sabbath had obtained a more permanent recognition. 2. Vigils, originally night-services observed by the first Christians on the eve of Sundays and festivals, partly in imitation of the Jewish custom of celebrating the entrance of the sabbath and of festivals on the evening of the previous day, and partly in fear of the danger to which a service in the daytime would have exposed the early converts. Although these night-services became unnecessary in the course of time, they were still continued till the 4th c., when owing to the abuses to which they led, they were abolished, or rather transformed into fast-days kept on the eve of great festivals in honor of Christ, Mary, Saints, and Apostles. 3. The great or 40 days' fast (Quadragesimal fast), most important and most rigorously enforced of all. The 40 hours of fast, in commemoration of the 40 hours during which Christ's body lay in the tomb, gradually expanded to 36, or rather 40 days, in pious allusion to the 40 days of Moses, Elijah, Christ, the 40 years' sojourn in the desert, or the 40 camps—all considered typical; and the fasting became severer the nearer the crucifixon week itself approached, in which many other signs of mourning and contrition were generally exhibited. 4. The Quatember fasts on the Wednesdays, Fridays, and Saturdays in one week of each season, in imitation of the four Jewish fasts in the 4th, 5th, 7th, and 10th months.—There were many other fasts, such as those of ordination, etc., but of only temporary existence. Without detailing the various dispensations granted by the church or the special pastoral letters generally issued before Quadragesima, or the variations in the observance of fasts and fasting in our own days, we note only, that fasts have in a great measure lost their former severity, and that only partial abstinence is the rule in all cases. The opinion held by the Rom. Cath. Church, and some other Christians, in former days, that fasting is meritorious, and conducive to the salvation of the soul, has undergone no change.

In the Greek Church, fasting was and is kept with much greater severity, the non-observance of it being the least venial of sins. The fast-days extend over almost three-quarters of the year. The principal ones are the Wednesday and Friday—with a few exceptions—throughout the year; the great Easter fast, lasting 48 days; that of Christmas, 39 days; that in honor of the Virgin, 14 days; and that of the Apostles, beginning on Monday after Trinity, and extending to June 29. Besides those smaller fasts of preparation, which correspond to the vigils of the Roman Church, they have many more occasional fasts.

The Church of England considers fasting a praiseworthy, but not obligatory custom. According to Hook's *Church Dictionary*, the distinction between the Prot. and the Rom. Cath. view of fasting consists in this, that the Rom. Cath. regards the use of fasting as an imperative means of grace, the Prot. as only a useful exercise preparatory for the means of grace. In proof how much the Church of England has left the question of fasting to the conscience and discretion of her members, it may be observed that she has neither defined the mode or degree of fasting, nor anywhere given a positive command to fast. It has been remarked that no bishop of the Church of England has in an episcopal charge laid down fasting as a positive requirement. The days named by the English Church as seasons of fasting or abstinence, are the 40 days of Lent (q.v.), including Ash Wednesday and Good Friday; the Ember (q.v.) days; the three Rogation (q.v.) days; and all the Fridays in the year (except Christmas Day); and the eves or vigils of certain festivals.

The Scottish almanacs contain lists of the *fast-days* of all the principal places in Scotland. These are generally one in each year, appointed by the kirk-session of the Established Church (Presb.) of the parish, or by concurrence of kirk-sessions in towns, but generally by use and wont fixed as to their date. The fast-day is always some day of the week preceding the *Communion Sunday*, or Sunday set apart in Presb. churches for the dispensation of the Lord's Supper. It is usually appointed as a day for 'fasting, humiliation, and prayer.' Business is generally suspended, shops shut as on a Sunday, and churches opened for public worship. By an act of parliament not many years since, factories are prohibited from carrying on work on the parish fast-day, but in consequence of the ecclesiastical divisions in Scotland, it has become more common than it was for agricultural and other kinds of work to be carried on. The fast-day of a large town is always a busy day on the railways, many taking advantage of it for excursions, and making in a day of amusement; too many, also, a day of dissipation and revelry. That it is right to keep up the fast-day in these circumstances is doubted by many who themselves conform to its religious observance, though of that observance *fasting* does not now generally form a part. Many, however, doubt if it ever was a good institution; alleging that it is inconsistent with the frequent celebration of the Lord's Supper, which they deem right and desirable, and to which there is a growing tendency. The Scottish Reformers, as appears from the *First Book of Discipline*, contemplated the ordinary celebration of the Lord's Supper at least once a month; and the fast-day, as it now exists in Scotland, derives its origin from a later period.

In the United States, the churches observe fasts according to their various rules, or by special appointment. Some of the older states, especially in New England, have from the beginning had the custom of an annual fast-day designated by the governor, whose observance of late years tends to be remote from religious. The president has on rare occasions of special national crisis appointed fast-days, which have had general observance. It is recognized, however, that all such appointments by the civil power have no force beyond that of pious recommendation and invitation.

A few words remain to be said of the Mohammedan fasts. Islam, as a development from Judaism and Christianity, adopted this custom with many others from both churches. During the whole month of Ramadan, in which the Prophet is fabled to have brought the Koran from heaven, eating, drinking, smoking, smelling perfumes, etc., are strictly forbidden from daybreak till sunset; for the intervening nights, however, all these restrictions are removed. There are, besides, many voluntary fasts, expiatory like the 10th of Moharram, corresponding to the Jewish Day of Atonement, or for the averting of the divine wrath in sudden calamities, or as an indemnification for the omission of certain pious acts, as the pilgrimage, etc. See JEWS: MOHAMMEDANISM: MONKS.

Besides the *Bible, Schulchan Aruch, Koran,* and the Fathers generally, see the following authorities on this subject: Bingham, *Orig.* IX., 1, 21; Fabricius, *Bibliogr. Antiquaria,* c. 11; J. A. Muratori, *De Quatuor Temporum Jejuniis,* etc.; J. Dallœus, *De Jejuniis et Quadragesima,* 1654; Schöne's *Geschichtsforschungen,* Th. 1; *Briefe über d. Gottesd. d. morgenl. Kirche,* von Dr. E. v. Muralt (Leip. 1838); Siegel, *Altchristl. Alterthümer;* Dassel, *De Jure Tempor. Quadrages.,* 1617; Walch, *De Jejunio Quadragesimali* (Jenæ 1727); Homborg, *De Quadragesima Veterum Christianorum et ritibus in ea quondam usitatis diss. qua etiam de recentior. Papist., Græc., Russ., Syrian., Georgian., Maronit., Jacobit., etc., disseritur* (Helmst. 1677).

Fasting, or deprivation of food, is, in a physiological sense, inconsistent with the continuance of life in most warm-blooded animals more than a few weeks. If water is not supplied, the period is much shorter, being in man commonly not more than a very few days, or at most a week. Persons have been found in coal-pits and mines, and in other situations where access to food has been impossible, but where water could be had, as long as six weeks after their seclusion, still alive, though very feeble; and a very small daily allowance of food has supported life longer than this, as in some cases of shipwreck, and other accidents at sea. Cases of alleged fasting, longer than this, as in the notorious woman of Tutbury, England, are certainly in most instances impostures. The insane appear sometimes to bear fasting better than the healthy. Hibernating animals (see HIBERNATION) are capable of sustaining the want of food for an apparently indefinite period of weeks during the winter sleep; but no warm-blooded animal can endure fasting in anything like the same degree as the reptiles, in many of which, indeed, the natural state of existence is one of long intervals between the times of taking food, and in which the vital change of texture is remarkably slow. Thus, the remarkable amphibious animal, the *Proteus anguinus,* has been known to live for years without food, and the same is true of salamanders, tortoises, and even goldfishes. In fasting, the body gradually emaciates, most of the secretions are arrested, or greatly diminished, and at last the animal heat falls rapidly in all parts of the body. In attempting the recovery of persons reduced by fasting, food must be given in very small quantities at a time, and of the most nourishing and digestible quality; stimulants should be either withheld, or very cautiously administered. The most important point, next to the regulation of the food, and sometimes even before food is given at all, is the removal of the torpor and chill of the body by gradually applied heat, with friction of the limbs. See Tiedemann's *Physiology;* Burdach's *Physiology;* Chossat, *Recherches sur l'Inanition.*

FAST AND LOOSE: a cheating game, called also *Pricking at the Belt,* or *Prick the Garter,* which appears to have been much practiced by the gypsies in the time of Shakspeare. The following is a description: 'A leathern belt is made up into a number of intricate folds, and placed edgewise upon a board or table. One of the folds is made to resemble the middle of a girdle, so that whoever shall thrust a skewer into it would think he held it fast to the board; whereas, when he has so done, the person with whom he plays may take hold of both ends, and draw it away.'

FASTEN, FASTNESS: see under **Fast 1.**

FAS'TEN'S EVE: see Shrovetide.

FASTI, *făs'tī* [L., pl. of *fastus,* according to divine law; from *fas,* divine law]: applied to things that are according to divine law. Hence the *dies fasti,* or lawful days, among the Romans, were the days on which it was lawful to transact business before the prætor. But the sacred books in which the lawful days of the year were marked, were themselves denominated *fasti,* and the term was employed, in an extended sense, to signify various kinds of registers, which have been often confounded with each other. These registers fall into two principal divisions—the Fasti Sacri or Kalendares, and the Fasti Annales or Historici.

1. *Fasti Kalendares,* or calendars of the year, were kept exclusively by the priests for about four centuries and a half after the building of the city. The appearance of the new moon was proclaimed by a pontifex, who at the same time announced to the people the time which would intervene between the Kalends and Nones: see Calends: Calendar. On the Nones, the country-people assembled for the purpose of learning from the Rex Sacrorum the various festivals of the month, and the days on which they would fall. In the same way, those who intended to go to law, learned on what days it would be right (*fas*) to do so. The mystery with which this lore was surrounded, for purposes of power and profit, by the favored class, was dispelled by Cn. Flavius, the scribe of Appius Cæcus, who surreptitiously copied from the pontifical book the requisite information, and published it to the people in the forum. From this, time-tables (*fasti*) became common, much resembling modern almanacs. They contained the days and months

of the year, the Nones, Ides, lawful and unlawful days, etc.; astronomical observations on the rising and setting of the fixed stars, the commencement of the seasons, brief notices concerning the introduction and signification of certain rites, the dedication of temples, the dates of victories, disasters, and the like. In later times, the exploits and honors of the imperial family were duly entered in the calendar. The celebrated *Fasti* of Ovid is a sort of poetical companion to the calendar, as published by Julius Cæsar, who remodelled the Roman year.

Several very curious specimens of fasti on stone and marble have been discovered, of which one of the most remarkable is the Kalendarium Prænestinum, which stood in the lower part of the forum of Præneste, described by Suetonius. Of these ancient fasti, 11 are enumerated by Foggini, learned Italian antiquary. One of the most interesting is a rural almanac, known as the Kalendarium Rusticum Farnesianum, cut on four sides of a cube, each side of which is divided into three columns, each column embracing a month. The various agricultural operations to be performed in each month are given on this curious relic, in addition to the ordinary information contained in these calendars. In the month of May, for example, the rustic is told that his corn must be weeded, his sheep shorn, his wool washed, etc.

2. *Fasti Annales or Historici,* were chronicles, containing the names of the consuls and other magistrates of the year, and an enumeration of the most remarkable events in the history of Rome, noted opposite the days on which they occurred. From its application to these chronicles, the word fasti came to be used by the poets as synonymous with historical records. A very interesting specimen of fasti of this class was discovered in the forum at Rome 1547. The fragments into which it had been broken were collected and arranged by Cardinal Alexander Farnese, and placed in the Capitol, where they may still be seen.

FASTIDIOUS, a. *făs-tĭd'ĭ-ŭs* [L. *fastidĭōsŭs*, disdainful, fastidious—from *fastidĭŭm*, aversion: It. *fastidioso:* F. *fastidieux*]: difficult to please; over-nice. FASTID'IOUSLY, ad. *-lĭ.* FASTID'IOUSNESS, n. squeamishness of mind or taste.—SYN. of 'fastidious': squeamish; over-critical; punctilious; particular; difficult; disdainful; over-delicate.

FASTIGIATE, a. *făs-tĭj'ĭ-āt*, or FASTIG'IATED, a. *-ā-tĕd* [L. *fastigĭŭm*, that which is made pointed, the highest point: It. *fastigio*]: in *bot.*, having a pyramidal or sheaf-like form, from the branches being erect and close to the stem, as in the poplar-tree.

FASTIGIUM, n. *făs-tĭj'ĭ-ŭm* [L.]: pediment of a portico, so called because it follows the form of the roof; the comb or ridge of a roof.

FASTNET LIGHT: light-house, on a rock off the Irish coast, 3½ m. s.w. of Cape Clear (q.v.); with a revolving light 148 ft. above high water, visible 18 miles.

FAT, a. *făt* [Ger. *fett;* Icel. *feitr;* Dut. *vet*, fat]: stout; opposite of lean; plump; rich; fertile: N. a solid oily substance of a white or yellow color, found in animals; the best part; in *Scrip.*, for VAT: V. to grow fat or full-fleshed; to make fat. FAT'LY, ad. *-lĭ*. FATS, oily substances solid at ordinary temperatures, and not differing essentially from the liquid oils (see OILS). ANIMAL FATS: see FATS, ANIMAL. FAT'NESS, n. quality of being fat or plump. FAT'TISH, a. *-tĭsh*, somewhat fat. FAT'TY, a. *-tĭ*, containing fat; having the qualities of fat; caused by fat; greasy. FAT'TINESS, n. *-nĕs*. FAT'LING, n. a lamb or kid, or suchlike, fattened for slaughter. FAT'TED, a. made fat. FATTEN, v. *făt'n*, to make fat; to make stout or plump; to enrich; to grow plump or fleshy. FATTENING, imp. *făt'nĭng:* N. the process of making fat; the state of becoming fat. FATTENED, pp. *făt'nd:* ADJ. made fat or plump. FATTENER, n. *făt'-nėr*. FAT-HEN, n. in *bot.*, name applied to various plants, especially to certain *Chenopodiaceæ*, having thick, succulent foliage. FAT-VESICLES, n. in *phys.*, the vesicles in the bodies of men and the inferior animals in which fat is deposited, often in the interstices between organs. FATTY ACIDS, a series of organic acids, some of which are combined with glycerine to form fat (see OILS). FAT LUTE, composition of linseed oil and pipe-clay (see LUTE). FATTY-INFILTRATION, n. in *anat.*, an infiltration of the tissues with fat deposited in them from the blood. It is only a deposit, and is therefore not synonymous with fatty degeneration, which is the abnormal deposition of free fatty matter in the elements of animal bodies. FATTY-KIDNEY, n. in *med.*, name for Bright's disease of the kidney.

FAT, n. *făt:* OE. for VAT.

FATA MORGANA, *fâ'tă mŏr-gâ'nă* [It. the fairy *Morgana*—from It. *fata*, a fairy; Bret. *mor*, sea; *gana*, fine lady]: striking kind of mirage at sea, observed especially in the Strait of Messina. A spectator on the shore sees images of men, houses, ships, etc., sometimes in the water, sometimes in the air, the same object having frequently two images, one inverted: see MIRAGE.

FATAL, a. *fā'tăl* [F. *fatal*—from L. *fatālis*, of or pertaining to fate, decreed—from *fātŭm*, a prediction, fate: It. *fatale*]: deadly; mortal; causing death or destruction; inevitable; necessary; calamitous. FA'TALLY, ad. *-lĭ*, in a fatal manner; mortally. FATALITY, n. *fă-tăl'ĭ-tĭ* [F. *fatalité*]: tendency to danger or disaster; inevitable necessity; mortality. FATALISM, n. *fā'tăl-ĭzm*, the doctrine of an inevitable necessity overruling all things. FA'TALIST, n. one who maintains that all things happen by inevitable necessity. FA'TALIS'TIC, a. *-tĭk*, implying fatalism: see FATE.

FATE, n. *fāt* [OF. *fat*, fate—from L. *fātŭm*, what is spoken, destiny: It. *fato* (see FATAL)]: inevitable necessity; event predetermined; lot; destiny; death; destruction. FATED, a. *fā'tĕd*, doomed; invested with any power or quality by fate; decreed by fate. FATES, n. plu. *fāts*, in *anc. myth.*, the three goddesses or destinies supposed to preside over the life and death of every individual—named respectively Clotho, Lachesis, and Atropos (see PARCÆ).—SYN. of 'fate': doom; fortune; chance.

FATE—FATALISM: denoting a vague conception which has had more or less place in all religions. The words are derived from the Latin *Fatum*, which has primarily a passive signification, denoting something uttered—a supreme decree or ordinance. The Greeks expressed the same thought by *Eimarmenē*. *Moîra*, was the name given to the active personification of the idea—the goddess Fate or Destiny. It represented, in Greek mythology, the final monotheistic element—the vague Unity binding together and dominating over the crowd of Olympian deities. In Homer, *Moîra* has a double meaning, appearing sometimes as superior to the will of Zeus, and sometimes as inferior to this will. With the course of Grecian thought, the conception of Fate became more spiritualized. In Æschylus it is an inexorable Destiny; in Sophocles and Plato, it is more of a free and ordering Will. In the latter forms of Greco-Roman speculation, it undergoes various modifications. With the Epicureans, it seems identical with Chance (*Tuchē*); with the Stoics, it is the very opposite of this. In the one case, the Absolute is a mere blind fatality; in the other case, it is an imminent necessity of reason, governing with iron sway the apparently accidental phenomena of life.

In modern times, in Christianity and Mohammedanism the same general conception is found in various forms. In Mohammedanism, the Highest is conceived as an arbitrary and inexorable law, swallowing at every lower law of activity, and permitting no scope to freedom of development in human nature. In Christianity and the modern speculation which it has colored, the conception shows itself less broadly in the well-known doctrines of Predestination and of Philosophical Necessity. In the Predestination theory of Augustine, Calvin, and many others, the old fatalistic doctrine is repudiated; the recognition of a free self determining element in the divine Will, separates their idea of it altogether from that of a mere blind Destiny; but the influence of the mode of thought out of which the old idea sprang, appears in the manner in which the divine decrees are sometimes spoken of as inexorably overbearing human freedom. In the doctrine of philosophical necessity promulgated by Leibnitz and some other thinkers, and in a somewhat different form by Modern Positivism, the same idea emerges under the name of inevitable sequence—of an invariable connection linking together all phenomena material and mental. An immutable law is declared to pervade and harmonize all existence. This is a far higher conception, but it is not difficult to see how easily in minds of a certain order it might lapse into the old pagan doctrine of Fate.

The doctrines of Predestination and of Philosophical Necessity have been supposed mutually to support each other; in reality, they are very different doctrines. The first starts from the dominating conception of the divine Will as over-ruling all things, and approaches fatalism by ascribing in certain cases such an absorbing energy to the will as to leave no power of free action to any other Will.

It conceives, or at least admits the conception of, everything as swallowed up in the single omnipotence of the Divine. It is in tendency *Pantheistic.* The other starts from the dominating conception of law in nature, and approaches fatalism by investing this law with an immutable and self subsistent character. It looks at all existence as a mere undeviating routine of development, and tends in exact opposition to the other doctrine, to shut out the Divine behind the screen of the Natural. It is in tendency *Atheistic.* It is merely the *tendency* of the respective speculations that is thus characterized.

The conception of Fate in some higher or lower, worthy or unworthy form, springs irresistibly from man's consciousness of the transcending greatness of what is outside and above his own feeble existence—of the objective Power that incloses and molds his own subjective activity. As such, the conception will never wholly disappear from human speculation, however endlessly modified it may be.

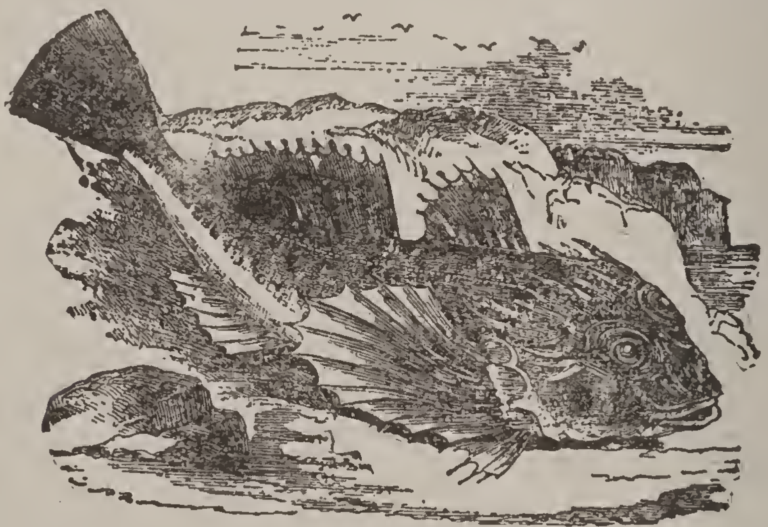
FATEHGANJ: see FUTCHGUNGE.

FATEHGARH: see FUTTYGURH.

FATEHPUR: see FUTTEHPUR.

FATHER, n. *fâ-thėr* [AS. *faeder;* Icel. *fathir;* Goth. *fadar;* Gr. and L. *pater;* Ger. *vater,* father]: a male parent; the first ancestor (see PARENT AND CHILD: FAMILY: PATRIA POTESTAS); a common title, applied to a protector, deliverer, or supporter; God the Creator; a familiar term for an old man; any man reverend for age, learning, or piety; a name given to Rom. Cath. priests; the first originator: V. to ascribe or charge to one as his offspring or production; to adopt anything as one's own. FA'THERING, imp. adopting as one's own; ascribing to any one as the father. FA'THERED, pp. *-thėrd.* FA'THERLAND, n. one's native land. FATHER-IN-LAW, n. the father of one's husband or wife. FA'THERLESS, a. without a father. FA'THERHOOD, n. the character or authority of a father. FA'THERLY, a. *-lĭ,* paternal; like a father: AD. in the manner of a father. FA'THERLINESS, n. parental kindness and care. FATHER-LONGLEGS, n. common name for the crane-fly; called also daddy-longlegs. THE FATHER, the first person of the Holy Trinity (see TRINITY, DOCTRINE OF THE). THE FATHERS, the early Christian writers till the seventh—some say thirteenth—c. To FATHER IT ON ME, to impute it to me.

FATHER-LASHER, *fâ'thėr-lăsh'ėr* (*Cottus bubalis*): very common fish on the British coasts, the most spiny of the British species of *Cottus* (q.v.), and armed with strong spines particularly on the back of the head—which is large—and on the gill-covers. When touched, it distends its gill-covers, sets out its spines, and assumes a very threatening appearance. Its general aspect is indeed forbidding, and boys who angle from the rocks and pier-heads are usually averse to touch it, though it is said to be wholesome and agreeable food. It is of a brown color above, whitish beneath, curiously marbled and spotted, the fins marbled black and white. American species are known as sculpins, sea-robins, sea-toads, etc.



Father-Lasher (*Cottus bubalis*).

FATHERS OF THE CHURCH (*Patres Ecclesiastici*): certain early writers of the Christian Church. The term Abba, Grecized ἀββας (Father), in use among the Talmudists as a synonym of Rabbi (my master), and constituting, according to Maimonides, the third or lowest honorary title of a Doctor of the Divine Law, was in the first centuries of Christianity applied indiscriminately to all theological writers distinguished by learning, genius, or piety. Gradually, however, the word Father, or, more fully, Father of the Church, was confined to those teachers whose writings were considered pre-eminently orthodox, and who might be looked upon as the *progenitors*, as it were, of certain dogmas, upon the development of which they had exercised a more or less direct influence; while those writers who diverged into the fields of heretical opinion were called simply *Scriptores Ecclesiastici* (Church-writers). Out of the number of the former, some few master-minds, to whom the church owed a still greater tribute, were again singled out as *Doctores Ecclesiæ* (Doctors of the Church), which title of pre-eminence, however, is bestowed on many writers who lived subsequently to the time of the Fathers, in consideration of their 'purer and more excellent doctrine' (Benedict, xiv., *Bulla, Milit. Eccles.*).

The temporal limits within which the Fathers are to be confined, as well as their proper share of authority in matters of faith, have long been points of grave discussion. While some include the Fathers of the 1st. c., generally called the Apostolical Fathers, on account of their being the contemporaries or disciples of Christ and the apostles, they are excluded by others; again, by some, the 7th c. is made the closing period, while others carry the list down to the 12th, or even the 13th century.

With respect to the authority of the Fathers, some, like Fredegis, held their words as sacred as those of the prophets and New Testament writers; while others, like Alphonso di Castro, Melelius Cano, and Cardinal Cajetan, ridiculed the notion that Symmachus should be made equal to St. Paul, or Didymus to St. John the Evangelist. Others like Pope Gregory and the majority of writers, took the middle course of regarding them not as infallible, much less as prophets and apostles, but held, that when in matters of faith the most perfect and unswerving unanimity reigns among them, then only, the Holy Ghost is to be considered to speak through them. See RULE OF FAITH: INFALLIBILITY.

Immense as is the range and variety of their writings, ascetic, apologetic, polemical, exegetical, moral, historical, or dogmatical, so also is the diversity of their individual value. Nothing can be further from historical justice than either the wholesale laudation or condemnation of these writers as a body; but whatever stand we may take, we cannot but see that their writings are of great moment either as instruction or as history. Stretching over the entire extent of that period which forms the turning-point between the antique and modern world, they faithfully and often unconsciously portray that awful change, of which they were in no small degree the instruments—the gradual wane of old faiths, and of an old civilization, and the slow and struggling rise of that which was to replace them; while they preserve the most minute and trifling details with the same accuracy as the most momentous event, as each happened to bear upon their subject. The philosopher, the historian, the antiquary, each and all will find their writings, as a whole, an inexhaustible fund. Of no less interest, perhaps, are their works in relation to the writers individually. These, issuing from all parts of the then known world, from all ranks, all creeds, could not but impress the stamp of their nationality and callings, besides that of their youth or age, vigor or feebleness, upon their writing—Jew, Greek, Roman, African, Spaniard—orator, poet, lawyer, statesman, priest, they all bring with them that which was their own before they embraced the new faith: their dialectic power, their fantastic poetry, their graceful speech, their stern austerity. What Greek subtlety did theoretically for the development of dogma in Origen and Athanasius, that also Roman thoroughness did practically for the erection of the hierarchy in Leo the Great and Gregory III.; and while from Egypt came asceticism and monachism, the ascendency of spiritualism over sensualism is owing to those who came from the n. coast of Africa. To some extent, Platonism, especially neo-Platonism, Aristotle, and Greek philosophy generally, are found developed in these works, and infused into the new faith by the former teachers of the academies themselves, who mostly retained their old philosophical garb.

The following is a brief survey of these writers: for the more eminent among them, see the respective titles. According to the now generally adopted method of dating them from the 1st to the 7th c., they are divided into two distinct periods, the first of which extends to the Council of Nicæa, 325. Of those who head the list, the Apostolic Fathers—so called from their supposed connection with Christ and the apostles—very little need be said, as their writings, mostly of an ascetic character, have come down to us in a corrupt and mutilated state, and as the writers themselves owe their chief celebrity to the times in which they lived. We have here Barnabas, the son of Teostes, and the companion of the apostle Paul (Acts ix. 27; xii. 25); Clement, supposed to have been third Bp. of Rome; and the Clement mentioned by Paul (Phil. iv. 3); Hermas, identical perhaps with the Hermas of Paul's Epistle to the Romans (xvi. 14); Ignatius, Bp. of Antioch; Polycarp, Bp. of Smyrna; Papias; Dionysius the Areopagite, etc. Next follow the Apologists, or those Fathers whose chief aim was the defense of the new faith against the Roman state, and non-Christian authors; and who were the first to make their scientific culture, and especially the Platonic philosophy, subservient to Christianity, for this purpose: Quadratus the 'Evangelist,' travelling missionary; Aristides, philosopher; Justin Martyr, well-known author of the two Apologies and the Dialogue with Trypho (or rather Tarphon); Tatian of Assyria, who. having examined the different forms of worship, as well as the systems of philosophy prevalent in his time, felt satisfied with none but Christianity, and became a disciple of Justin, and a vindicator of the philosophy of the 'barbarians;' Athenagoras, who addressed his Apology to the Emperor Marcus Aurelius and his son Commodus, and wrote a Defense of the Doctrine of the Resurrection; Theophilus, Bp. of Antioch; Miltiades, etc. Next come the Church Fathers of Asia Minor, men of more practical and peaceful tendencies: Hegesippus, perhaps an Ebionite; Irenæus, Bp. of Lyon and Vienne, who wrote a refutation of the Gnostic system; Hippolytus, his disciple, of unknown birthplace and renowned name. In the N. African Church, the development of which is of the utmost moment. inasmuch as its language, dogmas, and laws were adopted by the greater part of the Christian world in the West, we find Tertullian of Carthage, rhetorician and advocate, a man of profound mind and vast influence; Cyprian, author of the *Testimonies* in favor of Christ; Commodian, writer of the *Rules of Living;* and Arnobius, rhetorician of Sicca, in Numidia. The first comparatively barren, though otherwise highly important church, is the Roman. The pre-eminently practical Roman mind looked more to the outward growth and well-being of the church than to literary excellence, and thus we have only two distinguished authors to be noticed here—the Presbyter Caius, known as an opponent of the Montanists; and the Presbyter Novatian, who wrote a treatise on the Jewish laws respecting food. The church which, more than any other, endeavored to combine speculation with faith, and which gradually became, through its high degree of culture and erudition, the very centre of Christianity, is the Alexandrian. And here we have Pantænus; Clement the Alexandrine, known chiefly by his Stromata or Elements of the Gnosis; Origen, called Adamantinus, eminent Neo-Platonist, born 185 in Alexandria, one of the most influential writers of the whole Christian Church; Herculas, with his disciple Dionysius, a liberal aud moderate man; Gregory, worker of miracles; Pamphilus, and Julius Africanus, first Christian chorographer.

In the second period, which dates from the Nicæan Council, and comes down to Gregory II., 604., period altogether superior, on account of the great number of intellectual and erudite men who devoted their lives and labors to the church, we have to distinguish the Greek from the Latin Fathers. Among the Greek, we have again to draw a line between those of the Alexandrine school on one hand—like Eusebius Pamphili, the Herodotus of the church; Athanasius, father of orthodoxy; Basil the Great, Doctor Ecclesiæ, and his brother Gregory of Nyssa; Gregory of Nazianzen, called the Theologian, by war of eminence; Didymus; and Cyrillus, some time Patriarch of Alexandria, chief prosecutor of Nestorius—and on the other hand those of the Antiochian school, where we find Ephraem Syrus, 'the prophet of the Syrians;' Cyril of Jerusalem, the converted Arian; John Chrysostom, of brilliant eloquence; Diodorus, B. of Tarsus, one of the chief founders of the

Antiochian school; and Theodoretus, Bp. of Cyrus. Besides these, we find, of Greek Fathers who belonged to neither school—Epiphanius, violent adversary of Origen; Socrates Scholasticus, continuator of Eusebius's *Ecclesiastical History;* Philostorgius, Arian Church historian; Logomenus; Evagrius; Macarius the Elder, known chiefly through his miracles and combats with the devil; Procopius of Gaza, rhetorician; and Joannes Scholasticus, famous through his collections of canonical law. Among the Latins, we have to enumerate first the African Fathers: Fabius Victorinus; Augustine of Tagaste in Numidia, greatest dogmatist of the Western Church; Pope Gelasius I. (492—496), who finally fixed the canon of the Bible for the Rom. Church; and the Bishops Fulgentius, Junilius, and Facundus. Of Spaniards, we have Prudentius, poet; Paulus Orosius, whom Augustine used as his messenger to the East in his controversies with Pelagius. Of Gauls there are Hilarius Pictaviensis, Bp. of Poitiers about 350, the Athanasius of the West; Paulinus of Nola; Sulpitius Severus, friend of Martin of Tours; Vincent of Lerins, once a soldier, who wrote under the name of Peregrinus; Sidonius Apollinaris, Bp. of Clermont; Gennadius, author of an ecclesiastical literary history; Ennodius from Arles, who exerted himself to unite the Eastern and the Western Church; and Gregorius Turonensis, who wrote *Historia Ecclesiastica Francoum*, the basis of Frankish history. From other countries we have Sedulius, an Irishman; Joannes Cassianus, a Scythian; and Mercator, of unknown birthplace. We conclude with the Italians themselves: Lactantius Firmianus, the Christian Cicero; Julius Firnisius Maternus of Sicily; Ambrose, Metropolite of Milan, who raised his see to such a power that it dared to resist Rome herself till the 12th c; Rufinus of Aquileia, defender of Origen against the charge of heresy brought against him in the West; Eusebius Hieronymus, undoubtedly most learned of all the Latin Fathers, and who mastered also the Greek and Hebrew languages, collected in Palestine the most valuable notes for the elucidation of the Scriptures, and also corrected the Latin edition of the Vulgate; Pope Leo I.; Boëthius; Aurelius Cassiodorus, whose *Historia Tripartita*, in 12 books, served for a thousand years as a compendium of ecclesiastical history; the two poets, Arator and Venantius Fortunatus; and Pope Gregory I. (550–604), regarded by Protestants as having first given the Western Church its peculiarly Rom. Cath. stamp by developing the idea of the Eucharist into a Theophany, and making it the centre of the worship. His works, especially his letters, are invaluable for the study of his own times, especially for the history of the conversion of the West.

On the MSS. of the Fathers, see *Petri Lambeccii Commentarii de Bibliotheca Cæsarea Vindobonensi.* The editors of the works of the Fathers are of two classes—those of the individual Fathers whose writings are the most voluminous and of highest dogmatical importance, and the general Patristic collections which comprise the writings of the less voluminous or minor Fathers. In the former class, the first place, beyond all dispute, belongs to the celebrated Benedictine editions, by the members of the great Maurist congregation of the French Benedictine order (see Benedictines), of which community the task of editing the Fathers came to be considered as the recognized work. The Benedictine editons of the greater Fathers, with the exception of two or three, still maintain the very highest place in the estimation of the learned. Of the collections of the works of the Fathers, the most important are those of La Bigne, Galland, Rössler, Walch, Zimmerman, and Migne. Reference may be made also to Cardinal Mai's *Bibliotheca Patrum, Spicilegium Romanum*, and *Classici Auctores*, and to the *Spicilegium Solesmense* of the Benedictines of Solesme. Translation of the principal Fathers are numerous. For the chief works on the more important Fathers, see their several titles.

FATHER TOM: see Burke, Thomas Nicholas.

FATHIPOOR: see Futtehpur.

FATHOM, n. *făth'ŭm* [AS. *fæthm*, a bosom, an embrace: Icel. *fadma;* Dan. *fadme*, to embrace: Icel. *fadmr*, a bosom, a fathom]: the length between the extremities of both arms extended; a measure of length of six ft., used chiefly in reference to marine soundings and in mines; in *OE.*, reach; penetration; depth: V. to reach; to master; to comprehend; to try the depth and to find it. Fath'oming, imp. Fath'omed, pp. *-ŭmd.* Fathomer, n. one who fathoms, penetrates into, or comprehends. Fath'omable, a. *-ŭm-ă-bl*, able to be measured in depth, etc. Fath'omless, a. bottomless; that cannot be penetrated or comprehended. Fathom-wood, n. in *naut.*, slabs and other offal or waste of timber sold at the yards by fathom lots, cubic measurement.

FATIGATE, v. *făt'ĭ-gāt* [L. *fatigātus*, wearied, fatigued]: in *OE.*, to exhaust with labor; to fatigue; Adj. in *OE.*, worn out by labor; fatigued. Fat'igating, imp. Fat'igated, pp.

FATIGUE, n. *fă-tēg'* [F. *fatigue*—from L. *fatigārĕ*, to weary or tire]: weariness; exhaustion of strength from mental or bodily labor; lassitude; toil; labor: V. to tire or weary; to exhaust with labor. Fatig'uing, imp.: Adj. inducing weariness. Fatigued', pp. *-tēgd':* Adj. wearied; harassed. Fatigue duty, the labors in which soldiers are often engaged distinct from the use of arms. Fatigue-dress, the dress worn by soldiers in doing rough or laboring work. Fatigue party, a number of soldiers on fatigue-duty.

FATIMIDES, *făt'ĭ-mīdz*, or Fat'imites, *-ĭ-mīts:* Arabian dynasty which reigned for nearly two centuries over Egypt. Its founder was Mahadi-Obaidallah, A.D. 910–934. He asserted that he was descended from Fatima, daughter of the Prophet, and Ismael, a grandson of Ali. He thus won over to his side all the adherents of the widely diffused Ismaelites, an extravagantly schismatic sect of Mohammedans in Africa, and overthrew the race of the Aghlabides, who ruled at Tunis. His successor extended his dominion as far as Fez, and his descendant, Moëzz, in 970, conquered Egypt, expelled the reigning family, removed his court thither, founded Cairo, assumed the title of Caliph, thus proclaiming himself the lawful successor of the Prophet, and subdued Syria and Palestine. After the death of Moëzz, the F. maintained their high position for some time; but gradually degenerated, and resigned all the cares of government into the hands of their viziers. Their power then rapidly declined, and their vast territories melted away. In religious matters, the F., because they were raised to power by the followers of Ali, took upon themselves the protection of the Shiite sect, and the establishment of the Ismaelitic doctrines. Between 1002–21, the Caliph Hakem-Biamr-Allah persecuted the orthodox Mohammedans or Sunnites, as well as Jews and Christians. He founded an academy at Cairo, and endowed it largely, but connected with it a secret society for the diffusion of Ismaelitic opinions. In the first stages, the novice was shown the untenable nature of the precepts of the Koran; in the sixth, the advanced student found that religious legislation must give way to the claims of philosophy, in the seventh, a mystic pantheism was proved to be the true philosophy; and finally, in the ninth, the initiated discovered that he was not required to believe anything, and might do whatever he pleased. The system, with considerable modifications, found a home among that peculiar people the Druses (q.v.). After the death of Adhid, the last of the F., 1171, the founder of the dynasty of the Ayubides, Salâh-ed-dîn (Saladin), took possession of Egypt.

FATLING, FATNESS, FATTEN, FATTY, etc.: see FAT 1.

FATS, ANIMAL: solid oily substances in the animal body, concerning whose exact nature there is considerable difference of opinion among chemists. According to most chemists, they are composed of an admixture of three separate fats—margarine, stearine, and oleine, of which the two former are solid, and the latter fluid, at ordinary temperatures. Heintz, who has carefully studied these bodies, declares, however, that margarine is not a simple fat, but a mixture of stearine and palmitine (a solid fat occurring in palm-oil); and he considers human fat to be a mixture of stearine, palmitine, and oleine. For the chemical characters of these substances, see MARGARINE: OLEINE: PALMITINE: STEARIC ACID. The physiological relations of the fat remain to be considered.

Fat, usually inclosed in vesicles, is found very extensively in the animal kingdom. It is abundant in many larvæ, and occurs more scantily in most insects. It is found in the mollusca, and is comparatively abundant in all the divisions of the vertebrata. In most fish, it occurs throughout the body, but is abundant especially in the liver, where it is found in the hepatic cells, and not in its own characteristic vesicles. In reptiles, it exists chiefly in the abdomen. In birds, we find it especially about the peritoneum, and under the skin. In mammals, it is very generally diffused, but the greatest quantity is under, the skin, in the omentum, and round the kidneys.—The quantity of fat in the human body varies considerably at different periods of life. In the earlier stages of fetal existence, there is scarcely any; in new-born children, there is usually a considerable quantity deposited under the skin, and the organism continues rich in fat till the age of puberty, when a marked diminution of the substance occurs. It again increases about middle life, and then occasionally occurs in great excess; for example, three or four inches of fat are frequently found under the skin of the abdomen in corpulent persons. Extraordinary deposits of fat in some particular part of the body are observed in certain races of men and animals. One of the most remarkable examples of this peculiarity is afforded by the Hottentot women, in whom the fat accumulates in the gluteal region to such an extent as to give a most remarkable prominence to that part of the body; and a somewhat analogous deposit exists in a variety of sheep (*Ovis steatopyga*, the fat-buttocked sheep), in which a large mass of fat, sometimes attaining a weight of 40 lbs., is developed on the buttocks, and takes the place of a tail.

The origin of the fat in the animal body must undoubtedly be referred chiefly to the fat taken with the food. It has, however, been proved by the most careful investigations on various animals submitted to the process of fattening, on bees fed with cane-sugar, or with honey containing scarcely any wax, and on the larvæ of the insects inhabiting galls, that the animal, like the vegetable organism, has the power of forming or producing fat, far more fat being found, in these experiments, in the body of the animal, than could be referred to the fat taken in the food. The excess must therefore have been formed either from the non-nitrogenous portion of the food, such as starch and sugar; or from the nitrogenous matters, such as fibrin, albumen, etc. In the case of the bees, it was distinctly proved that the fat was formed from sugar; while in the case of the larvæ of the gall-insect, it was similarly shown that it was produced from the starch which forms the interior of the gall in which the animal lives; and as we have no corresponding evidence of the convertibility of fibrin, albumen, etc., into fat (though such a conversion is not improbable), we must for the present regard the nitrogenous foods as the chief fat-formers next to fat itself.

The physiological value of the fats is due partly to their physical, and partly to their chemical characters. The uses of the fat deposited beneath the skin are, first, to protect the body from external shocks by a uniform diffusion of pressure through the whole adipose tissue; and, second, to keep up the heat of the body, by materially checking, through its very slight conducting power, the loss of free heat by radiation. This use of the fat is seen most clearly in some of the lower animals (the seal, whale, etc.), which are exposed to very low temperatures. Another physical use of fat is to promote the mobility of various organs. Hence, in cases of extreme emaciation, it always remains in the parts where motion is most essential, as the heart, and the orbit of the eye. Another of its important physical properties is that of rendering other bodies supple, and diminishing their brittleness. This use of fat is very conspicuous in the bones.

The chief chemical use of the fat is its power of exciting and supporting the animal heat. In the oxidation of the fats in the animal organism, whether the process be gradual or rapid, a large amount of heat must necessarily be liberated; and that they are oxidized, and for the most part reduced to carbonic acid and water, is evident, because they neither appear in any quantity in the excretions, nor, as a general rule, accumulate beyond a certain point in the organism. An accumulation of fat thus serves as a reservoir of combustible matter in time of need. This is evident especially in the case of hybernating mammals, for example, hedgehogs, in which an enormous quantity is deposited just before the hybernating period: during this period, it gradually disappears, its carbon being slowly consumed in the respiratory process, and keeping up the animal heat. Fat is, moreover, one of the most active agents in the metamorphosis of animal matter. Lehmann ascertained that a certain though small quantity of fat was indispensable to the complete gastric digestion of nitrogenous food, a fact confirmed by the observation that in experiments on artificial digestion, the solution of substances used as food is considerably accelerated by the presence of a little fat. The occurrence of fat in the milk and in the egg, as also in all highly cellular organs (as, for example, the liver), is a clear indication that this substance acts an important part in the process of cell-formation; and no animal-cell or cell-yielding plasma has ever been observed in which fat is not a constituent. An undue accumulation or increased growth of the fatty tissue gives rise to the condition known as Obesity (q.v.).

FATUOUS, a. *făt'ū-ŭs* [L. *fatŭŭs*, silly, doltish: It. *fatuo*]: feeble in mind; silly; very defective in intellect: **FATUITY**, n. *fă-tū'ĭ-tĭ*, or **DEMENTIA** [F. *fatuité*]: weakness or feebleness in mind, consisting in the impairment or extinction of certain mental powers, or of all. Esquirol has quaintly said that the idiot and imbecile are the poor who have never been rich, but that the fatuous or dements are the rich who have been made poor. This impoverishment is sometimes so extreme, and the sufferer is so little influenced by consciousness as to lose a knowledge of his own existence; and so little influenced by impressions through the external senses, and by the instincts of the sensory ganglia, as to be equally ignorant of the existence of others. Life is vegetative merely. This deprivation may be partial or complete. It may appear as a weakening of sensibility. This is not the tolerance of powerful or painful impressions, or indifference to such, springing from abstraction or engrossment of the attention, but positive extinction of perception; or it may present the more common form of enfeeblement of intelligence, of memory; of the will, where the patient is apathetic, passive, plastic. The disease may involve the affections and the moral sense, and abrogate the power of decision, and all spontaneity of action and thought. Incoherence in ideas and words may be made to constitute another form, though generally regarded as a characteristic; whether it amounts merely to forgetfulness, or to confusion or irrationality, to inconsecutiveness and inability to express instincts and wishes. Delusions and hallucinations may co-exist with these conditions, but, like the real impressions received by this class of the insane, they are feeble, fugacious, and uninfluential. Under all these aspects, the essential element is privation of power; and this exists as a specific mental disease arising from obvious causes, unassociated with general alienation, acute in its nature, and rapid in its progress. It is most frequently the disease of youth, of the period of puberty, contemporaneous with growth, with debilitating and exhaustive processes, and depending, in all probablity, as in the other forms, upon insufficient nutrition of the brain. At this age, the injury is reparable, and what may be designated juvenile dementia, has the rare distinction of being curable. More frequently, it is the sequel of mania, melancholia, and severe affections of the nervous system. The deterioration here arises from actual changes in the nervous structure, which render healthful nutrition impossible; so that, though mitigation, and sometimes to a marvellous extent, is within reach of treatment, recovery is believed impracticable. Again, it is an affection of old age; and though senile dementia may seem but an exaggerated state of dotage, it is accompanied by such marked physical changes, as to leave no doubt that it originates in circumstances differing widely from that gradual degeneration of the tissues which is evidenced by the 'second childishness and mere oblivion.' Lastly, this state may follow fever, when it is transitory, and generally of brief duration. Fatuity is one of the few morbid mental conditions recognized in the legal code as relieving from the consequences of criminal acts, and as disqualifying for the administration and disposal of property. Esquirol, *Des Malad. Ment.*, II. p. 219.

FAUBOURG, n. *fō'bûrg* [F.—from mid. L. *foris-burgus*, the burg without or out of doors: comp. Gael. *fo*, under; *borg*, or *burg*, a town or fort]: a suburb; a quarter outside the gates of a city.

FAUCES, n. *faw'sēz* [L. *faucēs*, the upper part of the throat, a narrow inlet: It. *fauci*]: the upper part of the throat; the entrance of the gullet; in *bot.*, the gaping mouth of certain flowers, as the foxglove; in *conch.*, the opening into the first chamber of a shell. FAUCAL, a. *faw'kal*, of or pertaining to the fauces or gullet; specifically, in phonology, applied to certain deep guttural sounds peculiar to the Semitic and some other tongues.

FAUCET, n. *faw'sĕt* [F. *fausset*, a short pipe—from *faulser* and *fausser*, to make a breach in anything]: a short pipe for inserting into a cask to draw off the liquor; OE. spelled *fasset*.

FAUCHER, *fō-shā'*, LEON: 1803, Sep. 8—1854, Dec. 14; b. Limoges: French publicist and statesman. He studied at first philology and archeology; but about the period of the July revolution (1830), betook himself, with enthusiasm, to journalism and political economy. He became successively editor of the *Temps*, the *Constitutionnel*, and the *Courrier Français*, 1830–42, publishing many articles on political economy. In 1843, he began to write for the *Revue des Deux Mondes* a series of articles on the industrial condition of England, which appeared in 2 vols. 1845, under the title *Études sur l'Angleterre*, and constitute the most weighty of his productions, though Englishmen reckon the author greatly in error in many points. At the general elections of 1846, he was elected for the manufacturing city of Rheims. In the chamber of deputies, he voted with the dynastic opposition. A ready but not brilliant speaker, he came forward as one of the leading advocates of free trade, and published in the *Siècle*, and in the *Revue des Deux Mondes*, a number of vigorous essays on national economy. After the revolution of 1848, he was both in the constituent and in the legislative assemblies for the dept. of Maine. When Louis Napoleon was chosen pres., F. became first minister of public works, and subsequently minister of the interior; but when the pres. proposed to appeal to universal suffrage, F. resigned, and after the *coup d'état* he withdrew from political life. Many of his most valuable contributions to the science of politics are in the collection of the *Economistes et Publicistes Contemporains*, and in the *Bibliothèque des Sciences Morales et Politiques*

FAUGH, int. *faw*, and **Foh**, *fō* [F. *pouah*, faugh: Gael. *fuath*, aversion]: interjections expressing disgust or aversion—similar to *fie* and *phew*.

FAULD, n. *fawld* [etym. doubtful]: tymp-arch or working arch of a furnace.

FAULKNER'S ISLAND: island belonging to N. Y., in Long Island Sound, off Guilford, Conn. It has a prominent light-house and a fog-bell.

FAULT, n. *fawlt* [F. *faulte*, or *faute*, a defect, an omission—from It. *falta*, a defect—from mid. L. *fallĭtă*, the act of failing—from L. *fallo*, I deceive: Sp. *faltar*, to lack]: an offense; a slight crime; an error or mistake; a defect; among *miners*, a fissure or break accompanied by a displacement of the strata on each side (see Dislocation, in Geol.). **Faul'ted**, a. applied to strata fissured and displaced. **Fault'less**, a. free from defect or blemish. **Fault'lessly**, ad. *-lĭ*. **Fault'lessness**, n. **Faulty**, a. *fawl'tĭ*, imperfect; containing defects. **Faul'tily**, ad. *-lĭ*. **Faul'tiness**, n. the state of being defective or erroneous. **To find fault**, to express blame or dissatisfaction. **To find fault with**, to blame. **At fault**, puzzled; in a difficulty. **Fault'finding**, the habit of censuring or blaming frequently on grounds trivial or unjust. **Fault'ful**, a. *-fûl*, in *OE.*, saturated with crime.—Syn. of 'fault': blemish; failing; imperfection; weakness; blunder; vice; foible; want; absence; default;—of 'faultless': blameless; spotless; stainless; perfect.

FAUN, n. *fawn* [L. *Faunus*, one of the gods of the fields or woods]: a woodland deity, represented usually with the legs of a goat; a satyr: named from Faunus, a mythical king of Italy, who instructed his subjects in agriculture and the management of flocks, and was afterward worshipped as the god of fields and of shepherds. The festival of the *Faunalia*, Dec. 5, referred to his protection of agriculture and cattle. Fauna was his female complement. He was worshipped also as a prophetic divinity. As deity of the woods and of flocks and herds, he corresponds to the Greek Pan: the idea also arose of a plurality of Fauni or Fauns, like the Greek Satyrs, who were represented as monster deities with short horns, pointed ears, tails, and goats' feet, and to whom all terrifying sounds and appearances were ascribed. **Fauna**, n. *fawn'ă*, all the animals peculiar to a country, area, or period. Thus, we speak of the fauna of Great Britain, the recent fauna, the fossil fauna, the fauna of the Eocene period or formation, etc. The term bears the same relation to the animal kingdom that *Flora* does to the vegetable. In the fauna of any country are included only those animals indigenous to it, not those which have been introduced. **Faunist**, n. *fawn'ist*, a naturalist.

FAURE, *fōr*, **François Félix**: president of the French republic: 1841, Jan. 30—1899, Feb. 16; b. Paris. He was elected pres. 1895, Jan. 17. During the Franco-German war, 1870-71, he organized a battalion of mobile guards, and afterward went to Paris with the Havre firemen to stop the incendiary fires started by the communists. He was elected deputy from Havre to the chamber 1881, and entered as under-sec. of commerce and colonies in the cabinet which Gambetta formed the same year; occupied the same position in the Ferry cabinet 1883–85, and the Tirard cabinet 1888; and afterward was elected deputy, 1889 and 93. Until 1894, May, he was one of the vice-presidents of the chamber, and was then made minister of the navy in the Dupuy cabinet, which was overthrown by the chamber. The principles advocated by Gambetta and made triumphant by Sadi-Carnot have marked the political course of F. Unlike his predecessor in office, however, F. is regarded, not as a champion of capitalists, but as a representative of the common people, the *bourgeoisie* whose ancestors made the revolution of the 18th c.; and he has shown no disposition to impose upon the people his private views of government. Most of his life has been spent at Havre, where he was a commission and shipping merchant, and at one time pres. of the chamber of commerce. His wealth was accumulated by industry and thrift. He is a good English scholar, and well versed in the study of economical questions; has published important works and reports on the commercial and other interests of France. His election was regarded as a triumph of the moderate republicans.

FAURIEL, *fō-re-ĕl′*, CLAUDE CHARLES: 1772, Oct. 21—1844, July 15; b. St. Etienne, dept. of Loire: French philologist, historian, and critic. He studied at the College des Oratoriens at Tournon, afterward at Lyon, and 1799, was appointed to a situation under Fouché; but destitute of political ambition or predilections, and passionately fond of learned studies, F. resigned his office 1802, and turned to literature. He made himself familiar with Sanskrit, Arabic, and the treasures of classical antiquity and of the middle ages; and though he did not write much, yet what he wrote was of great value. Renan may exaggerate when he affirms that F. ‘put in circulation the greatest number of ideas’ of any contempory writer; but even the Germans allow that in many points of literary history, criticism, and philology, F. was 20 years in advance of his age. After the July Revolution, he was appointed prof. at the Sorbonne; in 1836, he published his chief work, *Histoire de la Gaule Méridionale sous la Domination des Conquérants Germains* (4 vols. Paris), one of the best specimens of historical investigation and art in modern times. Worthy of notice, also, particularly for its remarkable historical introduction, is his edition of the Provençal rhymed chronicle, *Histoire de la Croisade contre les Hérétiques Albigeois* (Paris 1837). One of F.'s best known essays is that on the origin of the Epic of Chivalry in the middle ages. He died at Paris. Two years after his death appeared a collection of his professorial lectures, *Histoire de la Poésie Provençale* (3 vols. Paris 1846), in which F. endeavors, with great erudition and originality of criticism, to show that to the Provençals must be attributed the composition and primitive development of the greater portion of the romances of chivalry, including those which describe the contests of the Christians and Moors in Spain, and those which form the Charlemagne cycle, thus finding the origin of the old Spanish and German poetry on the soil of France These views have found some strong opponents

FAUSSE BRAIE, or BRAYE, *fōs'brā* [F. *fausse*, false, *braie*, breeches]: in *fortification*, a low rampart encircling the body of a place, and raised about three ft. above the level ground; mostly discarded by modern engineers, except in front of curtains, under the name of *Tenailles* (q.v.). The French engineers gave this title to the work as an adaptation from the Italian term *Fossa Brea*, which had its origin from the F. B. being commonly in the ditch, in front of the main wall. The F. B. had the advantage of giving an additional tier of guns for defensive purposes; but the still greater disadvantage of affording facilities for the scaling of the parapet.

FAUSSE RIVIÈRE, *fōs rē-vē-är'* (*False River*): lake of Louisiana, notable as an index of the physical character of the country. Till about a century and a half ago, it was a channel of the Mississippi—a fact which probably is expressed in its name. Here, as in other alluvial formations, the beds of the running waters are undergoing incessant changes.

FAUST, *fowst*, DOCTOR: according to tradition, a celebrated dealer in the black art, during the latter half of the 15th, and the beginning of the 16th c.; frequently confounded with Johann Faust (or Fust); b. Knittlingen, in Würtemberg: or, as some say, at Roda near Weimar. He is said to have studied magic at Cracow. After having spent a rich inheritance left him by his uncle, F. is alleged to have made use of his 'power' to raise or conjure up the devil, with whom he entered into a contract for 24 years, obtaining during that time his fill of earthly pleasure, but at its termination surrendering body and soul into the hands of the Great Enemy. The devil gave him an attendant spirit or demon, called Mephistopheles—other names are given by the later traditionists,—with whom he travelled about, enjoying life in all its forms, and astonishing people by working wonders, till he was finally carried off by the Evil One, who appeared in terrible guise, between twelve and one o'clock at night, at the village of Rimlich, near Wittenberg, though several other places lay claim to that very questionable honor. Some have doubted, considering the monstrously mythical form in which his career has come down to us, whether such an individual as F. ever existed; but it is now generally believed that there was a basis of fact, on which tradition has built its grotesque superstructure. Gorres, indeed, asserts that one George Sabellicus, who disappeared about 1517, is the real F.; but Philip Melanchthon—the man of all the reformers whose word in regard to a matter of fact would most be trusted —says that he had himself conversed with Dr. Faustus. Conrad Gesner (1561) is equally positive; and Luther, in his *Table Talk*, speaks of Dr. F. as a man lost beyond all hope. The opinion that prevails, reckoned intrinsically the more probable, is that some man of this name, possessed of varied knowledge, may possibly have practiced jugglery (for all the wandering savans of the middle ages had a touch of the quack about them), and thus have been taken by the ignorant people for a dealer in the black art, and one who maintained a secret and intimate relation with evil spirits. His widely diffused celebrity not only occasioned the wonders worked by other so-called necromancers of an earlier age—Albertus Magnus, Simon Magus, and Paracelsus—to be attributed to him, but likewise many ancient tales and marvellous legends were gradually transferred to him, till he appears finally the very hero of magicians. But while, on the one hand, the narrative of F.'s marvels afforded amusement to the people, on the other, they were made use of for instruction by the clergy, who pointed out, in the frightful fate of F., the danger of tampering with the 'black art;' and the abominableness of a life sunk in sensuality and vice. The myth of F. has received a manifold literary treatment. First come the *Volksbücher* (or people's books), which record F.'s enterprises and feats: the oldest known appeared at Frankfort 1588. Then came an 'improved' edition of the same, by Widmann, *Wahrhaftige Historien von denen gräulichen Sünden Dr. Joh. F.'s* (True History of the Horrible Crimes of Dr. John F., Hamb. 3 vols. 1599); and 1695, a work was published at Nürnberg by Pfitzer, based upon that of Widmann. The oldest of these books was translated into all languages of civilized Europe. Imposters also published books of magic under the name of F., such as *Faust's grosser und gewaltiger Höllenzwang* (Faust's Great and Potent Book of Spells), *Fausten's Miraculkunst* (Faust's Art of Performing Miracles), and *Dreifache Höllenzwang* (The Threefold Book of Spells). These wretched productions are filled with meaningless scrawls and figures, interspersed with texts from the Bible scandalously misapplied; but in the belief of the vulgar, they were supposed capable, when properly understood, of accomplishing prodigies. That the poetical art should in due time have seized on a subject affording so much material for the fancy, was inevitable; consequently German literature abounds in elegies, pantomimes, tragedies, and comedies on Faust. Since the end of the 17th c. the *Puppenspiel* (Puppet-show) of Dr. F. (published first at Leipsic 1850) has been one of the most popular pieces in Germany. It forms the transition from the rude magic tales concerning F., to the later philosophic conception of the Faust-myth, which has become the most perfect poetical expression of the eternal strife between Good and Evil in the soul of man. The first writer who treated the story of F. dramatically was the English writer Christopher Marlowe, about 1600 (German translation by W. Müller, Berlin 1818); but the grandest work on the subject is Goethe's *Faust*, the first part of which appeared under the title of *Dr. F., ein Trauerspiel* (Leip. 1790), and afterward in a remodelled form, *F., eine Tragödie* (Tübingen 1808). The second part was published after Goethe's death, Stuttgart 1833. Besides may be mentioned Lessing's masterly fragment, *F. und die Sieben Geister* (F. and the Seven Spirits),

G. F. L. Müller's *Dr. F.'s Leben* (Dr. F.'s Life, Manh. 1778), and Klinger's *F.'s Leben, Thaten, und Höllenfahrt* (F.'s Life, Doings, and Descent into Hell; Petersb. and Leip. 1791). The plastic art also has found a fit subject in Faust. In Auerbach's cellar at Leipsic, where F. is said to have performed many of his feats, are two rude daubs of date 1525, representing F. and Mephistopheles riding out of the cellar on a wine-barrel. Rembrandt and Christoph von Sichem have illustrated the story of F., and, in modern times, Cornelius and Retzsch have done the same. See Peter's *Die Literatur der Faustsage* (3d ed. 1857); Engel's *Das Volksschauspiel Dr. F.* (1873).

FAUST (or FUST), JOHANN: d. 1460: chief promoter of the invention of printing, a rich citizen of Mayence: see GUTENBERG.

FAUSTINA, *faws-tī'na,* ANNIA GALERIA (*Faustina Senior*): wife of the Roman emperor, Antoninus Pius: died A.D. 141. Also, her daughter, FAUSTINA JUNIOR, wife of the Roman Emperor Marcus Aurelius Antoninus (successor to Antoninus Pius): d. 175 at a village near Mount Taurus. Both, but particularly the younger, were notorious for the profligacy of their lives, which their exemplary husbands in vain endeavored to check. After their deaths, institutions for the relief of poor girls were founded both by Antoninus and Marcus Aurelius in memory of them, and were called '*puellæ alimentariæ Faustinæ.*' Marcus Aurelius, in his Meditations, speaks highly of his wife; and an attempt has been made by Wieland to defend her against the imputations of the historians of the emperors.

FAUSTINUS I., *faws-tī'nŭs:* Emperor of Hayti, known, before his elevation to the throne, as Faustinus Soulouque: 1789–1867, Aug. 6 (reigned 1849–1859); b. San Domingo; a negro originally in very humble circumstances. In his earlier years, he acted as servant, afterward as adjutant, to Gen. Lamarre. He subsequently served under Presidents Petion and Boyer, and by the latter was raised to the rank of captain. After 1844, when the Haytian Republic—of which Gen. Boyer was then president—was dissolved, a struggle for the supreme power ensued, in which F. took an important part. In 1847 he was appointed by the senate pres. of the republic. A dreadful massacre of the mulattoes in Port-au-Prince took place at his instigation, 1848, Apr. 16, which, with similar measures, struck terror into the hearts of his opponents. In 1849, Aug., he had himself proclaimed Emperor of Hayti, a title which he held for about ten years; but a revolution having broken out 1858, and a republic having been declared, F. was forced to abdicate, 1859.

FAUTEUIL, n. *fō-tāl'* [F.—from OF *fauldetueil*—from mid. L. *faldĭstōlĭŭm*]: an arm-chair, generally highly ornamented; a president's chair: see FALDSTOOL.

FAUVETTE, *fō-vĕt':* French name, partially adopted in English, for some of the little song-birds of the family *Sylviadæ* or Warblers, having straight slender bills slightly compressed in front, the ridge of the upper mandible curving a little towards the tip, and the legs not long. They mostly belong to the genus *Curruca*, as the Blackcap, the Pettychaps, or Garden Warbler, the Whitethroat, etc., and to the genus *Salicaria*, as the Sedge Warbler, the Reed Warbler, etc. The Dartford Warbler (*Melizophilus Provincialis*), also is called Fauvette. They are all very lively little birds, continually flitting about in pursuit of insects, mostly frequenting bushy places; and some of them, particularly those of the genus *Salicaria*, preferring watery situations where reeds abound.

FAUX-BOURDON, n. *fō-bôr-dŏng* [F. *faux*, false; *bourdon*, a drone bass, a series of similar notes or a holding note as an accompaniment to the melody]: in *mus.*, a sort of harmony used by the old composers, and consisting of thirds and sixths added to a canto-fermo.

FAUX-JOUR, n. *fō-zhôr* [F. *faux*, false; *jour*, day, light]: false or contrary light; in *art*, false light; a term denoting that the light in which a picture is hung falls on it in a different direction from that in which the painter has represented it as coming.

FAUX-PAS, n. *fō-pâ* [F. *faux*, false; *pas*, step]: false step; mistake; breach of propriety, manners, or morality; a lapse from chastity.

FAVARA, *fâ-vâ'râ:* town of Sicily, in the s. of the island, province of Girgenti, four m. s.e. of the town of Girgenti. It has rich sulphur-mines. Pop. 16,000.

FAVART, *fâ-vâr'*, CHARLES SIMON: 1710, Nov. 13—1793, May 12; b. Paris: French dramatist. He became known by his *La Chercheuse d'Esprit*, performed 1741. In 1745 he married Mademoiselle Duronceray, herself a dramatic writer of some note and a singer of remarkable talent, and in the same year became director of the *Opéra Comique*. The fine taste and judgment of F. and his wife soon obtained for their theatre great reputation. It was they who made the first attempt to harmonize the costume of the actors and actresses with their impersonations, and to put a stop to the ridiculous practice of decking out soubrettes and country-girls in the attire of court-ladies. So powerful, however, was the opposition excited by the jealousy of the other theatres, that the *Opéra Comique* was closed in the first year of its existence. After some time spent with Maréchal de Saxe during his campaign in Flanders, F. and his wife (who d. 1772) returned to Paris, where the former continued to write operas. F.'s success as a writer was very great: he may be reckoned the father of the comic opera, and the happy successor of Le Sage, Piron, etc. The number of his pieces is about 60, of which the most celebrated are *Comment l'Esprit vient aux Filles*, *Le Coq du Village*, *Bastien et Bastienne*, *Ninnette à la Cour*, *Les Trois Sultanes*, and *L'Anglais à Bordeaux*. His works have been published several times. An edition in 10 vols. was published, Paris 1810, under the title of *Théâtre de Monsieur et Madame Favart*. A very interesting book, *Les Mémoires et la Correspondance de Favart*, giving pleasing glimpses of the literary and theatrical world of the 18th c., was published by his grandson, Paris 1809.

FAVELLA, n. *fă-vĕl'lă* [L. *favus*, a honeycomb: perhaps L. *favilla*, hot cinders or ashes], in *bot.*, a kind of conceptacle among the algæ. FAVOSE', a. *-vōs'*, in *bot.*, honeycombed; cellular. FAVUS, n. *fā'vŭs*, a disease of the skin, commonly known as scaldhead. FAVOSITES, n. *făv'ō-sīts*, in *geol.*, genus of lamelliferous corals, found in Silurian, Devonian, and Carboniferous strata. They were social corals, closely packed together, no space being left between the walls of the different corallites. As in the other palæozoic corals, the lamellæ are developed in multiples of four, and the older portion of the stony base is partitioned off by horizontal tabulæ. FAV'ULA'RIA, n. *-ū-lā'rĭ-ă*, in *geol.*, a genus of coal-measure stems whose leaf-scars resemble the arrangement of a honeycomb: see SIGILLARIA.

FAVEOLATE, a. *fa-vē'o-lāt:* formed like a honeycomb; alveolate; cellular.

FAVEROLE, n. *făv'ėr-ōl* [F. *faverolle*, a haricot bean, dim. of L. *faba*]: in *bot.*, water dragons, *Calla pallustris.*

FAVERSHAM, *făv'ėr-sham:* municipal borough and seaport in the n. of Kent, England; on a navigable creek, opposite Sheppey Isle, 8 m. w.n.w. of Canterbury. It consists chiefly of four streets in an irregular cross. It has a valuable oyster-fishery, employing 200 to 300 persons. It sends much agricultural produce to London by hoys. The creek admits vessels of 150 tons. In the vicinity are some of the most important gunpowder factories in the kingdom. Under the name of Favresfield, it was a seat of the Saxon kings, where Athelstan, 930, held a Witenagemôte. It has the remains of an abbey founded by King Stephen, where he and his queen, Matilda, are buried. St. Crispin is said to have been apprenticed to a shoemaker here. Near F. are some chalk caverns, with columns. In 1880, 13,047 vessels, of 637,447 tons, entered and cleared the port. Pop. (1881) 8,756; (1891) 10,478.

FAVIGNANA, *fâ-vēn-yâ'nâ:* chief of the Ægades, a group of islands in the Mediterranean, off the w. coast of Sicily. It is six m. from the Sicilian shore, and is about six m. long, with an average breadth of two miles. It has a town of the same name, with two castles, and a pop. about 5,000. F. is fruitful, has good pasturage, and produces excellent wine.

FAVILLA: see FAVELLA.

FAVONIAN, a *fă-vō'nĭ-an* [L. *Favonius*, the west wind]: pertaining to the west wind; hence, gentle, favorable, prosperous.

FAVOSITES, FAVULARIA, FAVUS, etc.: see FAVELLA.

FAVOR, or FAVOUR, n. *fā'vėr* [F. *faveur*—from L. *favōrem*, good-will—from L. *favĕō*, I befriend: It. *favore*]: kind regard; good-will; grace; support; patronage; a kind act or office; a gift; bows of white satin ribbons, as a wedding-favor; distributed at marriages in some countries, usually pinned on the breast of all concerned, attendants and postilions included. The favors of those more immediately interested are sometimes enriched with orange blossom. This is an old usage, connected with the love-knot of ancient northern nations; it is almost the only remaining token of merriment in the nuptial ceremonial, and is itself beginning to disappear.—See Brand's *Popular Antiquities*, edited by Ellis, article 'Bride Favours': something given to be worn, as ribbons; anything worn as a token; in *OE.*, feature; countenance: V. to assist; to befriend; to afford advantages for success. FA'VORING, imp.: ADJ. countenancing; facilitating. FA'VORED, pp. *-vėrd*, treated with favor; featured [*well* or *ill*]: in *OE.*, resembled in any way. FAVOREDNESS, n. *fā'vėrd-nĕs*, appearance good or bad. FA'VORABLE, a. *-vėr-ă-bl* [F. *favorable*]: friendly; kind; propitious. FA'VORABLY, ad. *-ă-blĭ*. FA'VORABLENESS, n. *-bl-nĕs*. FA'VORINGLY, ad. *-lĭ*. FA'VORER, n. *-ėr*, one who. FA'VORITE, n. *-vėr-ĭt*, one preferred before others: ADJ. esteemed; beloved; preferred. FA'VORITISM, n. *-ĭzm*, the disposition to favor or promote the interest of one before another. FA'VORLESS, a. destitute.—SYN. of 'favor, n.': kindness; present; benefit; countenance; lenity; promotion; befriending; benevolence; good-will; token; partiality; bias; letter; epistle.

FAVRE, *fâvr*, JULES CLAUDE GABRIEL: 1809, Mar. 21—1880, Jan. 19; b. Lyon: French advocate and minister. He was son of a merchant, studied for the bar, and passed at Lyon 1830. His political opinions were always intensely republican, and when pleading in numerous political lawsuits, F. frequently placed the state solicitors, and even the judges, in a very embarrassing position, by the boldness of his sentiments. As the defender of the *Mutuellists* at Lyon 1831, he was in danger of losing his life; this, however, did not prevent him from defending those who had been impeached in April, and commencing his speech with *Je suis Républicain*. From 1834, F. was a member of the Paris bar. In the revolution of 1848, Feb., he was home sec., in which capacity he wrote the notorious circular for which Ledru-Rollin's administration was so severely reproached, investing the commissioners of the republic with dictatorial authority in the provinces. He was active as a member of the committee of foreign affairs. After the election of Dec. 10, F. showed himself a persistent antagonist of Louis Napoleon, and after the flight of Ledru-Rollin, became the orator of the Mountain. The *coup d'état* closed his political career at this time. He refused to take the oath of fidelity to the imperial government, and betook himself again to his profession. In 1858, he defended Orsini, on his trial for a conspiracy to murder. In the same year, however, he became a member of the legislature. In 1870, Sep., after the downfall of the empire, he was appointed minister of war, and carried on negotiations with Count Bismarck. He resigned office 1871, July, and resumed practice at the bar. F. was greatest in political repartee, and though long accustomed to public strife, his language was noted for Attic elegance.

FAVUS, *fā'vus* [see FAVELLA]: disease of the skin, chiefly of the hairy scalp, characterized by yellowish dry incrustations more or less roundish, and often cup-shaped, composed of the sporules and mycelia (q.v.) of a vegetable growth belonging to the order of Fungi (q.v.). The disks of F. are produced with great rapidity, and spread rapidly, if not attended to at the first, over the whole scalp, destroying the bulbs of the hair, which becomes very short and thin, and then falls out altogether. F. is disgusting and unsightly, but hardly dangerous; it is contagious, but spreads only where cleanliness is greatly neglected, and is therefore almost unknown among the better classes. It is far more common among children than among adults, and seems more frequent in Scotland than in England, and on the continent than in either England or Scotland. The cure is sometimes attempted by a variety of medicated and simple ointments, and by pulling out the hair by the roots, or *epilation*, as it is called; but it seems hardly possible in inveterate cases to be rid of the disease without a very long persistence in habits of most scrupulous cleanliness; therefore the cure is seldom permanent, though easily attained for the time. F. is almost always followed by permanent baldness of the parts affected; unlike ringworm (q.v.), which is a minor disease of the same order.—The Favus fungus, *Achorion Schœnleinii*, is nearly allied to the fungus which has recently proved so destructive to vines, and has by some botanists been placed in the same genus, *Oidium*.

FAWCETT, *faw'sĕt*, EDGAR: author: b. New York, 1847, May 26. He graduated at Columbia College 1867, and has published *Short Poems for Short People* (1871); *Purple and Fine Linen* (1874); *Ellen Story* (1876); *Poems of Fantasy and Passion* (1877); *A Hopeless Case* (1881); *A Gentleman of Leisure* (1882); *An Ambitious Woman* (1883); *Song and Story*, *Tinkling Cymbals*, *The Adventures of a Widow* (1884) *The Buntling Ball*, *The New King Arthur*, opera libretto (1884,5); *Social Silhouettes* (1885); *Romance and Revery* (1886); and *The House at High Bridge* (1887).

FAWCETT, HENRY, M.A., D.C.L.: 1833–1884, Nov. 6, b. Salisbury, England: economist. He graduated at Trinity Hall, Cambridge, 1856; lost his eyesight by an accident 1858; was appointed prof. of political economy at Cambridge 1863; was elected member of parliament 1865, 68, 74; appointed postmaster-gen. in Gladstone's administration 1880, Apr.; and had his great scheme of post-office annuities put in general operation 1884, June. While postmaster-gen. he introduced many reformatory measures, and proved himself progressive and efficient. Among his numerous works are: *Manual of Political Economy* (1863); *Economic Position of the British Laborer* (1865); *Pauperism* (1871); and *Free Trade and Protection* (1878). He was appointed a privy councilor 1880, received the degree D.C.L. from the Univ. of Oxford, 1880, and that of doctor of political economy from the Univ. of Würtzburg 1882.—His widow, MILLICENT GARRETT F., is author of *Political Economy for Beginners* (1869), *Tales in Political Economy*, and jointly with her husband of a volume of essays and lectures on political and economical subjects.

FAWKES, *fawks*, GUY (properly GUIDO): 1570–1606, Jan. 31; b. of a Prot. family in Yorkshire, England: head of the conspiracy known by the name of the Gunpowder Plot. He became a Rom. Catholic at an early age, and served in the Spanish army in the Netherlands. Inspired with fanatical zeal for his new religion, on his return to England, he entered into a plot with several Rom. Cath. gentlemen for blowing up the king, his ministers, and the members of both houses at the opening of parliament, 1605, Nov. 5. Guy F. was taken with the burning match in his hand, tried, and after having been put to the torture, was publicly put to death. In remembrance of this event, in most large English towns, particularly in London, a grotesque figure, stuffed with straw, is carried about the streets on Nov. 5, and finally committed to the flames. A political and religious signification was again imparted to this custom by what was called 'the papal aggression' 1850, when the figure of Cardinal Wiseman (q.v.) was substituted for that of Guy Fawkes.

Guido Fawkes

Guido

Guy Fawkes's signature before and after torture.

FAWN, n. *fawn* [OF. *faon*, the young of any animal, then a doe or fawn—from mid. L. *fœtonus*, a little offspring—from L. *fœtus*, offspring, progeny]: a young deer. FAWN, or FAWN-COLORED, of a light-brown color like a fawn. FAWN'ING, imp. bringing forth a fawn.

FAWN, v. *fawn* [Goth. *faginon*, to rejoice: AS. *fægen*, joyful: Icel. *fagna*, to rejoice: comp. Gael. *fàn*, to dance attendance]: to carry to excess the appearance of pleasure; to court favor; to flatter meanly; to cringe. FAWN'ING, imp.: ADJ. flattering by cringing and meanness. FAWNED, pp. *fawnd*. FAWN'ER, n. one who. FAWN'INGLY, ad. *-lĭ*, in a cringing manner.

FAWSONT, a. *faw'sŏnt* [Gael. *fasanta*, customary, respectable]: in *Scot.*, respectable; in accordance with custom and fashion. FAUSONED, a. *faw'sŏnd*, in *OE.*, fashioned.

FAY, n. *fā* [F. *fée*, a fay, an elf (see FEY)]: a fairy; an elf.

FAY, n. *fā* [F. *foi*, faith—from L. *fidem*, faith]: an OE. spelling for FAITH, which see.

FAY, v. *fā* [Ger. *fügen;* Sw. *foga;* AS. *fegan*, to join together]: in *ship-building*, to join two pieces of timber close together. FAY'ING, imp. FAYED, pp. *fād*.

FAY, *fâ'ĕ*, ANDRÁS: 1786–1864; b. Kohany, in the county of Zemplén: Hungarian author. He studied philosophy and law at the Prot. college of Sárospatak, and then applied himself to literary pursuits. After two vols. of poetry, appeared the collection of Fables (*Mesék*, Vien. 1820), which gave him repute. The fables are like those of Phædrus and La Fontaine, but in prose. Richness of invention, simplicity of design, and truth of character, are evident in this work. Among F.'s dramatic works are the tragedy, The Two Bathorys (*A Két Báthory*, Pesth 1827); the comedies, Ancient Coins (*Régi Pénzek*), and Hunters in the Matra (*Mátrai Vadászok*). The novel, The House of the Béltekys (*A' Béltéky-haz*, Pesth 1832), is rather didactic, but exhibits many features of Hungarian domestic life. F. was a constant contributor to literary and scientific periodicals, and had his share in some of those pamphlets by which great social questions, for instance, female education, savings-banks, etc., were brought to a successful issue in Hungary. In reading F.'s works, we are frequently reminded of Dean Swift. F. was foremost among the leaders of the liberal opposition in the county sittings of Pesth 1825–40; but on the appearance of Kossuth, the strides of public life growing more and more rapid, F. gradually retired from political controversy. The first savings-bank of Hungary (at Pesth) was entirely F.'s work. His literary works were published in eight vols. Pesth, 1843–4.

FAY, *fā*, JONAS: 1737, Jan. 17—1818, Mar. 6; b. Hardwick, Mass.: patriot. He was educated for a physician, but spent the greater part of his life in public service. He was an army surgeon under Col. Ethan Allen at Ticonderoga; member of the convention which declared Vt. an independent state, and author of the declaration 1777; sec. of the state constitutional convention 1777, July; member of the council of safety; member of the state council 1778–85; judge of the supreme court 1782, and of probate 1782–87; and state agent of Vt. in congress 1777, Jan., 1779, Oct., 1781, June, 1782, Feb.

FAY, THEODORE SEDGWICK: author: b. New York, 1807, Feb. 10. He studied law, but abandoned it to become associate editor of the *New York Mirror* with George P. Morris and Nathaniel P. Willis, 1828. He spent several years in European travel, was sec. of the American legation at Berlin 1837–53, and U.S. minister-resident at Berne, Switzerland, 1853–61. He has published a notable series of papers on Shakespeare, a story of New York life, *Norman Leslie*, which was dramatized and played with success, and *Dreams and Reveries of a Quiet Man* (1832); *The Minute Book* (1833); *Sydney Clifton* (1839); *Countess Ida* (1840); *Hoboken, a Romance* (1843); *Robert Rueful* (1844); *Ulric, or the Voices*, poems (1851); *Views of Christianity* (1856); *History of Switzerland* (1860); *Great Outlines of Geography* (1867); and *First Steps in Geography* (1873).

FAYAL, *fī-âl':* one of the most important of the Azores (q.v.); area about 69 sq. m. It is very fertile, and has a dense population. In its centre is a mountain 3,000 ft. in height; and on its s.e. coast a convenient bay with good anchorage. Its principal town, Horta, is on this bay, lat. 38° 30′ n., and long. 28° 41′ w. Pop. of the island (1881) 26,264.

FAYALITE, n. *fā'ă-līt* [from *Fayal*, one of the Azores; Gr. *lithos*, a stone]: a pure iron chrysolite of a greenish or brownish-black color.

FAYBERRY, n. *fā'bĕr-rĭ:* the gooseberry.

FAYERWEATHER, *fār'wĕth-ėr*, DANIEL B.: merchant and philanthropist: 1821–1890, Nov. 15; b. in Stepney, Conn. At the termination of an apprenticeship with a farmer, he learned the shoemaker's trade, in Bridgeport, Conn., and afterward became a pedler of tinware, in Virginia, often taking pelts for payment. Returning to his trade in Bridgeport, he remained there till 1854, when he removed to New York, entering the employ of Hoyt Bros., dealers in leather. In 1870, the firm was dissolved, and later the business was conducted under the firm-name of Fayerweather & Ladew. In financial circles Mr. F. was noted for strict commercial honor. His habits were retiring and economical, but he was judiciously charitable. He was so little known outside of his circle of business acquaintances and personal friends that the publication of his will, bequeathing more than $2,000,000 to various charitable and educational institutions, and directing that $3,000,000 more be placed in the hands of executors for distribution among public institutions according to private instructions, attracted much attention. Among his bequests were: $25,000 to the Presbyterian Hospital, $25,000 to St. Luke's Hospital, $25,000 to the Manhattan Eye and Ear Infirmary, $10,000 to the Woman's Hospital, $10 000 to Mount Sinai Hospital, all in New York; $200,000 to Yale Univ. and $100,000 to its Scientific School, $200,000 to Columbia Univ., $200,000 to Cornell Univ., $100,000 to Bowdoin College, $100,000 to Amherst College, $100,000 to Williams College, $100,000 to Dartmouth College, $100,000 to Wesleyan Univ., $100,000 to Rochester Univ., $100,000 to Hamilton College, $100,000 to the Univ. of Virginia, $100,000 to Lincoln Univ., $100,000 to Hampton Univ., $100,000 to Maryville College, and $50,000 each to the Union Theol. Seminary, and Marietta, Lafayette, Wabash, Adelbert, and Park colleges. In 1891, his widow began legal proceedings to oppose the probating of the will. She did not object to the public bequests, but was not willing to have the executors receive $3,000,000. Subsequently the suit was withdrawn, on an agreement to divide the residuary estate between Yale, Harvard, Princeton, Columbia and the Woman's and Presbyterian hospitals in New York.

FAYE'S COMET: discovered by Hervé Auguste Étienne Albans Faye, 1843, Nov. 22, in the constellation of Orion. It had a short tail and bright nucleus, and has since been seen 1850, Nov. 28, 1858, Sep. 12, 1869, and late in 1888, but at no time has it been visible to the naked eye. Leverrier computed its entrance into the solar system about 1747, and established its mean distance from the sun at 3·8118 times that of the earth, eccentricity ·5576, inclination 11° 22′ 7″, period 7·414 years, and motion direct. Its discoverer was born in Saint Benoit, Indre, France, 1814, Oct. 5, studied astronomy with Arago, became prof. of astronomy 1873, and director of the national observatory at Paris 1878, Jan.

FAYETTEVILLE: a city and cap. of Washington co., Ark., in the Ozark Mountains; 1,500 ft. above the sea; on the St. Louis and San Francisco railroad. It is called the "Athens of Arkansas," and is a popular summer resort. It is the seat of Arkansas Industrial University; is the fruit center for northwestern Arkansas; and has flour mills, fruit evaporating establishment, large wagon factory, foundry, etc. Pop. (1890) 4,222; (1900) 4,670.

FAYETTEVILLE, *fī'ĕt-vĭl:* city of N. Car.; on the left bank of Cape Fear river, about 140 m. from its mouth. F. marks the head of natural navigation of the river; though by locks and dams it communicates with the upper basin of the river. The interior sends down coal, and the neighborhood is covered with forests of pine, traversed by 350 m. of plank-road, and yielding tar and turpentine, of which latter there are several distilleries. Cotton and flour manufacture are largely carried on by water-power. The extensive arsenal of F. was seized by the Confederates 1861, and destroyed by Sherman 1865. Pop. (1880) 3,485; (1890); 4,222; (1900) 4,670.

FAYUM, *fī-ôm':* Egyptian province, surrounded, in the form of a basin, by the Libyan Desert, and connected merely by a narrow valley with that of the Nile; between lat. 29°–30° n., and 30°–31° e. This peculiar depression of the desert extends about 30 m. from n. to s., and about 40 m. from e. to w., its lowest point lying 100 ft. below the banks of the Nile at Benisuef. F. is one of the most fertile provinces in Egypt; producing, in addition to the ordinary useful plants of the country, roses, apricots, figs, vines, olives, etc. in great quantities. This fertility, in a province the soil of which is naturally arid and sandy, is the result of irrigation. A canal from the Nile was, at an early period, dug westward through a gorge in the Libyan hills which here skirt the w. bank of the Nile, and after dividing into numerous branches, lodged its waters in a depression in the n.w., thus forming, it is said, the Lake Mœris (q.v.). The anc. capital of the province, called Krokodilopolis, and later Arsinoë, stood on the e. shore of Lake Mœris; and upon its ruins stands Medînet-el-Fayûm, chief town of the province, with pop. (1897) 33,069; pop. of province (1897) 371,006.

FEAL, n. *fēl* [OF. *fiel* or *feel*—from L. *fĭdēlĭs*, faithful]: in *OE.*, faithful, as a tenant or knight to his lord.

FEAL, n. *fēl*, or Fail, n. *fāl:* in *Scot.*, any grassy part; a grass-sod; turf (see Peat). Feal-dike, a wall built of sods. Feal and Divot, a predial servitude (q.v.) peculiar to the law of Scotland, in virtue of which the proprietor of the dominant tenement possesses the right of turning up and carrying off turf from the servient tenement for the purpose of building fences, roofing houses, and the like. The etymology of these words has been much disputed: Jamieson derives divot from *delve* (Sax. *delfan*, or *delven*), or, as alternative, says that it may have been formed by the monkish writers of old charters from *defodere*, to dig the earth: the former is more probable.

FEALTY, n. *fē'ăl-tĭ* [OF. *féelté* and *fealte*, fidelity—from L. *fidelĭtātem*, fidelity—from *fidēlĭs*, faithful, trusty: It. *fedele*, faithful]: loyalty; fidelity of a tenant or vassal to his superior. F. was anciently embodied in an oath, by which the tenant bound himself to the requisite service or dues, on entering to the lands. In taking the oath of fidelity, Littleton says, s. 91, that the tenant shall not kneel, nor shall make such humble reverence as in homage. The only object of F. in modern times is to keep up the evidence of tenure where no other services are due; but even to this effect it has gone into desuetude.

FEAR, n. *fēr* [AS. *fær;* Dut. *vaar*, fear. Icel. *far;* Sw. *fara*, danger: comp. Gael. *fuar*, cold, as the sensation created by great danger]: apprehension or slight dread of evil; an uneasy or painful emotion excited by impending danger; reverence; due regard; the object or cause of fear: V. to feel an uneasy emotion or impending danger; to be anxious; to reverence. Fear'ing, imp. Feared, pp. *fērd.* Fear'ful, a. *-fûl*, timorous; affected with fear; inspiring fear. Fear'fully, ad. *-lĭ*, in a fearful manner; in a manner to be reverenced. Fear'fulness, n. Fear'less, a. bold; courageous. Fear'lessly, ad. *-lĭ*. Fear'lessness, n. boldness; intrepidity. Fearsome, *fēr'sŭm*, fearful; terrible; dreadful; awful.—Syn. of 'fear, n.': dread; terror; alarm; awe; dejection; anxiety; solicitude; apprehension;—of 'fear, v.': to dread; apprehend; frighten; affright; terrify; venerate;—of 'fearful': timid; afraid; awful; terrible; dreadful; frightful; apprehensive; horrible; distressing; shocking;—of 'fearless': daring; intrepid; brave; heroic; undaunted; dauntless; bold; courageous; valorous; valiant.

FEAR, Mania of, or Panophobia, *păn-ō-fō'bĭ-a:* morbid or extreme development of the instinct of cautiousness. There are many morbid manifestations of it. Sudden fear in sleep, horrible dreams, nightmare, sleep-walking, have been regarded as symptoms of a special disease. Actual terror from irregular circulation in the sensory ganglia; the sense of falling or drowning in cardiac affections; incubus from disturbance of the circulation in the larger vessels by repletion, plethora, or position, where a delusion is added to the feeling of apprehension—all are allied, and distinguished by involuntary and excited cautiousness. It is not only, however, when the intelligence may be supposed to be dormant, and the instincts awake, that such exaggerated fears paralyze minds otherwise sane and sound. Murat, 'the bravest of the brave,' and James I. of England, learned if not wise, were subject to vague, uncontrollable panics, which for a time unmanned them. The condition is often found as a consequence and concomitant rather than a cause of disease of the heart. The presence of the *habitual* dread of evil, the fear of death, the sleepless and breathless anxiety during darkness, or solitude, or silence, as well as the sudden, wild, ungovernable panic, point to the existence of organic or functional diseases of the heart; and conversely, excited or irregular action of the organ, murmurs, angina, lead the astute psychologist to predicate fear as a characteristic of the mental condition. It precedes and is believed to produce chorea, cancer, and scirrhus. Proximately, however, it depends upon alterations in the capillary circulation, or nervous structure of the brain. Its characteristic is involuntary, irresistible, blind terror, which arises and continues without adequate cause, and is not influenced by reason or religion, nor even by removal of the supposed object of alarm. The disease has appeared epidemically during commercial panics, during the horrors of cholera and plague, and in that singular affection called Timoria, which is marked by debility, tremor, and terror, and has been traced to the effects of the damp, unhealthy regions in Sardinia and Sicily, where it exclusively occurs. Panophobia is hereditary, and has been traced through three successive generations. In reviewing the unobtrusive members of an asylum family, the pallid, startled, staring, flickering countenances may be detected as those of patients loboring under fear. They resemble melancholics in pallidity of skin, but in place of courting they shrink from sympathy; though horror-stricken by gloom, they hide in corners, they escape, they shriek in desperation, they climb trees, and apparently inaccessible places; and encounter real in order to elude fancied dangers; or they are motionless, paralyzed. They fear and flee from enemies, police, demons, death, punishment.—*Feuchtersleben*, *Principles of Medical Psychology*, p. 281; Arnold, *Observations on Nature, Kinds, Causes, and Prevention of Insanity*, etc., I. 257.

FEARNS, n. plu. *fārnz* [see Therms]: in *Scot.*, intestines; guts, as of sheep.

FEASIBLE, a. *fē'zĭ-bl* [F. *faisable*, easy—from F. *faire*, L. *făcĕrĕ*, to make or do]: that may be done; practicable. Fea'sibly, ad. *-blĭ*. Fea'sibil'ity, n. *-bĭl'ĭ-tĭ*, the quality of being capable of execution; practicability: also Fea'sibleness, n. *-bl-nĕs*.

FEAST, n. *fēst* [F. *fête*; OF. *feste*—from L. *festum*, a holiday, a feast: It. *festa*]: a plentiful entertainment to several or many guests; a banquet; something delicious to the palate; that which delights the mind; a church festival (see Festivals): V. to eat sumptuously; to entertain with abundant good things; to delight. Feast'ing, imp.: N. the act of eating luxuriously. Feast'ed, pp. Feast'er,

n. one who.—Syn. of 'feast, n.': treat; entertainment; festivity; festival; carousal; holiday; repast.

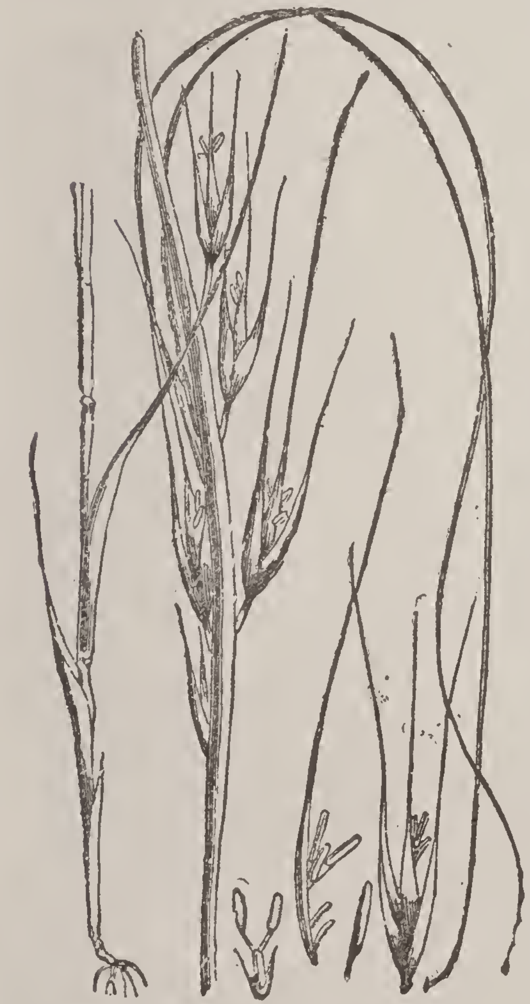
FEAT, n. *fēt* [F. *fait*, an exploit—from L. *factum*, a thing done]: a daring or bold act; an extraordinary act of strength, skill, or cunning; any exploit: Adj. in *OE.*, ready; skilful. Feat'er, the compar. degree; in *OE.*, neater; nicer: V. in *OE.*, to set an example to; to fashion. Feat'ed, pp. showed an example. Feat'ously, ad. *-ŭs-lĭ*, in *OE.*, neatly; dexterously. Featly, ad. *fēt'lĭ*, in *OE.*, neatly; nimbly.—Syn. of 'feat': act; deed; action; trick.

FEATHER, n. *fĕth'ĕr* [AS. *fæther;* Icel. *fiödr;* Dut. *veder*, feathers: Bav. *fledern*, to flutter]: part of the natural covering of a bird; a plume—the whole feathers of a bird are called its *plumage;* kind, nature, or class: V. to dress or adorn with feathers. Feath'ering, imp.: N. in *Goth. arch.*, an arrangement of small arcs or foils, separated by projecting points or cusps; a covering of feathers; in *rowing*, the turning of the blade of the oar horizontally as it leaves the water. Feathered, pp. *fĕth'ĕrd:* Adj. clothed or covered with feathers; furnished with feathers, as an arrow. Feath'erless, a. having few or no feathers. Feath'ery, a. *-ĕr-ĭ*, having the appearance of feathers; light as feathers; in *bot.*, having hairs which are themselves hairy. Feather-boarding, or Weather-boarding, n. arrangement of boarding in which the edge of one board overlaps a small portion of that next to it. Feather-edged, made thin at the edges. Feather-few, n. same as Fever few. Feather-foil, a wild plant; the water-violet; the *Hottŏnĭă inflata* of the United States, and the *Hottŏnĭă palus'tris* of Europe, ord. *Prĭmŭlācĕæ:* named from Peter Hotton, Dutch botanist: it grows under water, but sends its blossoms up into the air. Feather-joint, n. a mode of joining the edges of boards by a fin or feather let into opposite mortises on the edges of the boards. Feather-spring, n. the sear-spring of a gun-lock. Feather-star, *Comatula rosacea*. a member of the class Echinoderms, order Crinoids. Its body is pentagonal, with 10 slender feathery arms. When young the animal is attached to a stalk; when adult it becomes free. Feather-stone, probably corrupted from *federal stone*, a stone table in the open air at which some judicial proceedings were had, and covenants made. Feather-weight, n. in *racing*, lightest weight allowed to be carried by a horse in a handicap. Feathering float, n. the paddle or float board of a paddle-wheel, so arranged as to turn on an axis to present its broad side to the water at its lowest submergence, but to turn its edge to the water in entering and emerging. Feathering paddle-wheel, a wheel whose floats have a motion on an axis, so as to descend nearly vertically into the water and ascend the same way, avoiding beating on the water in the descent, and lifting water in the ascent. Feathering-propeller, n. an invention of Maudslay, London, in which the vanes of the propeller screw are adjustable, so as even to be turned into the plane of the propeller shaft and offer no resistance when the vessel is under sail and the propeller not used. Feathering-screw, n. the same as Feathering-pro-

PELLER. A FEATHER IN ONE'S CAP, an honor; a trophy. TO BE IN FULL FEATHER, to make a show; to be in full dress; to be up to the mark in any way. TO BE IN HIGH FEATHER, to be elated. TO SHOW THE WHITE FEATHER, to show signs of cowardice. TO TAR AND FEATHER, to smear with tar, and then cover with feathers. TO FEATHER AN OAR, to turn an oar on leaving the water, so that its blade may pass through the air horizontally, and then through the water vertically. TO FEATHER ONE'S NEST, to amass money, especially from holding an office or place; to make a snug, warm, comfortable home.

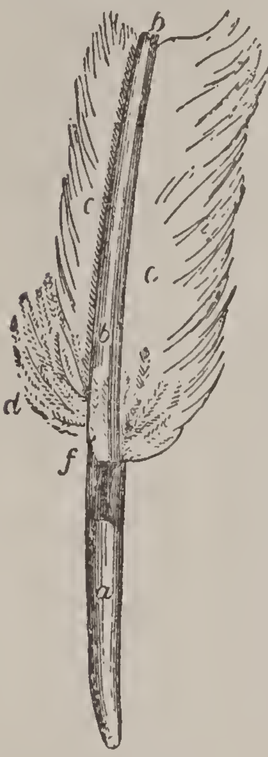
FEATHER, *fĕth'ėr:* river of Cal., feeder of the Sacramento. It flows through one of the richest gold-fields in the state. It receives the Yuba near Marysville, which appears to mark the head of navigation—the distance down the F. and the Sacramento to the harbor of San Francisco being about 100 miles.

FEATHER GRASS (*Stipa*): genus of grasses remarkable for the long awns which give a peculiar and very graceful appearance to the species, mostly natives of warm temperate climate. In some the awn is beautifully feathered, as in the best known species, the COMMON F. G. (*S. pennata*), found on dry hills in the middle and south of Europe. It is a perennial, easy of cultivation, and a favorite ornament of gardens. When gathered before the seeds are ripe, its feathery awns—sometimes 12 inches in length—remain attached, so that tufts o F. G. retain their beauty throughout winter. They are often dyed, to give variety to interior decoration, but are never more beautiful than in their natural yellowish-white. The feathery awns not only assist in the diffusion of the seed, which is carried by the wind to great distances, but in a very interesting manner help to fix it in the soil. The seed alights vertically, the furrowed base of the awn becomes twisted, so that its furrows form the threads of a screw, the feathery portion becomes horizontal, the wind acts on it, and the seed is screwed into the ground, and held by barbs. American species are Black Oat Grass (*S. avenacea*) and Porcupine Grass (*S. spartea*), both w. and s.w., awns 3–7 in. long.



Feather Grass (*Stipa pennata*).

FEATH'ERS: complicated modification of the tegumntary system, forming the external covering or plumage of birds, and peculiar to this class of animals. Notwithstanding the varieties of size, strength, and color, all F. are composed of a quill or barrel, *a;* a shaft, *bb;* and a vane, beard, or web, *cc,* on either side of the shaft, the vane consisting of barbs and barbules.



Feather.

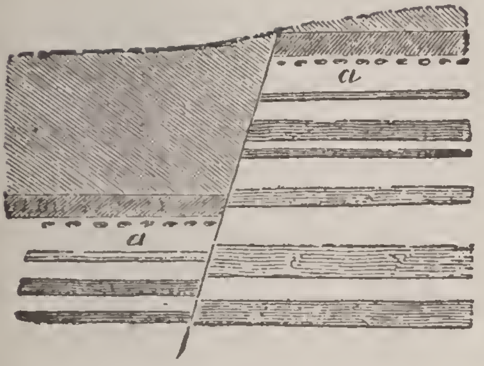
The quill by which the feather is attached to the skin is wider but shorter than the shaft, and forms a semi-transparent, horny, cylindrical tube, which terminates below in an obtuse extremity, presenting an orifice termed the lower umbilicus, *e.* A second orifice, leading into the interior of the quill, and termed the upper umbilicus, *f,* is situated at the opposite end, where the two vanes meet and unite. The cavity of the quill contains a series of conical capsules fitted one upon another, and united by a central pedicle; and the whole structure presents a remarkable combination of strength and lightness.

The shaft is always of greater length than the quill, and tapers gradually to its free extremity; it is flattened at the sides, is more or less convex on the back, and presents a longitudinal groove inferiorly. It is composed of white, elastic, spongy structure, covered by a thin horny sheath.

At the point of junction of the shaft and quill,—except on the feathers of the wings and tail—a small supplementary shaft is given off. furnished with barbs or fibres, and termed the plumule or accessory plume. In the ostrich it is altogether absent; in the rhea, it is represented by a tuft of down; in the emu it equals the original feathers in size, so that the quill supports two shafts; and in the cassowary there is a second plumule of considerable size, so that the quill presents three distinct shafts

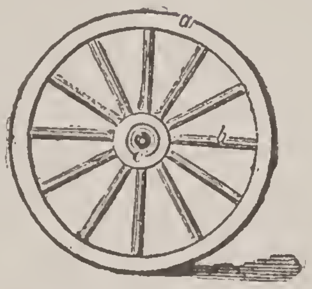
The vanes or webs are composed of numerous barbs or small fibres arranged in a single series along each side of the shaft. They are fine prolongations of the outer coat of the shaft, are of flattened form, and lie inclined toward the apex of the feather, with their flat sides toward each other, and their margins in the direction of the external and internal sides of the feather. The barbs are broader near the shaft than at the free apex, and in the large wing-feathers the convexity of one is received into the concavity of another. They are, however, generally kept in position by the barbules, which are minute curved filaments arising from the upper edge of the barb, much as the latter arises from the shaft. There are two sets of these barbules, one curved upward, and the other downward, and hose of one barb hook so firmly into those of the next, as to form a close and compact surface. In the ostrich, the barbules

PLATE 14.

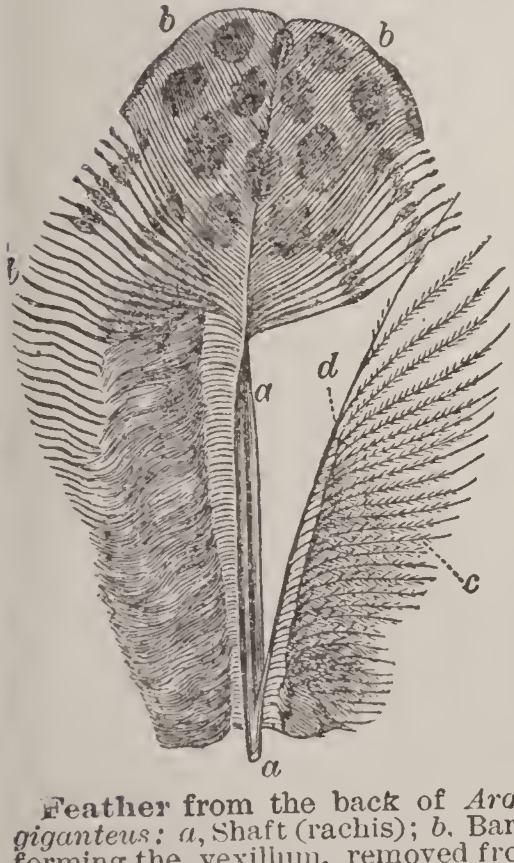


Fault: *a*, *a*, Show change of position in strata occasioned by a fault.

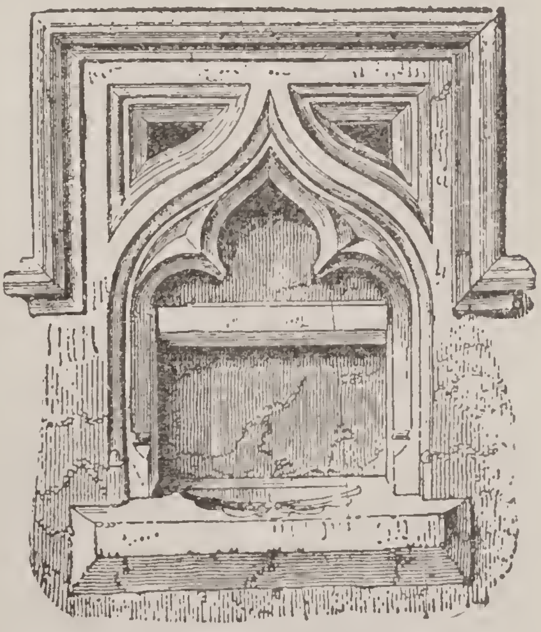
Dancing Faun.—Antique Statue, Florentine Museum.



Wheel: *a*, **Felly;** *b*, Spokes; *c*, **Nave.**



Feather from the back of *Argus giganteus*: *a*, Shaft (rachis); *b*, Barbs forming the vexillum, removed from one side of both shaft and undershaft; *c*, Barbules on the barbs; *d*, After-shaft.



Fenestella with Piscina.

are well developed, but are loose and separate, and it is this arrangement which gives to the feathers of this bird their soft, plumous appearance.

F. present numerous gradations of structure. In the cassowary, the wings, instead of being provided with ordinary F., are furnished with five cylindrical stalks destitute of barbs, so that there are merely the quill and shaft. On the breast of the wild turkey is a tuft of F. resembling long black hair. In the *Dasylophus Cumingii*, the F. of the crest, breast, and throat are changed, at their extremities, into round, horny lamellæ, looking like shining black spangles; and in the common waxwing or Bohemian chatterer, some of the wing-feathers present at their extremities small horny expansions, resembling red sealing-wax, both in color and consistence.

Besides the common F., the skin of many birds, especially of aquatic species—in which plumules rarely exist—is covered with a thick coating of down, which may be described as consisting of very minute F., each composed of a very small soft tube lying in the skin, from the interior of which arises a minute tuft of soft filaments, without any central shaft This downy covering secures warmth without weight, like the soft fur at the base of the hair of arctic mammals. In most birds, the skin also bears a good many scattered hair-like appendages, which indicate their relations to the ordinary F. by the presence of a few minute barbs toward the apex.

F. are developed in depressions of the skin, lined by an inversion of the epidermis which surrounds the bulb from which each feather springs; they grow, much in the same manner as hairs, by the addition of new cells from the bulb, which becomes modified into the horny and fibrous stem, and by the elongation of previously existing cells. They are, when first formed, living vascular parts, growing by nutrient vessels; but when they are fully formed, the vessels become atrophied, and the F. become dried up, and gradually die from the summit to the base. For a full account of the development of the different parts, see Prof. Owen's article, 'Aves,' and Prof. Huxley's article, 'Tegumentary Appendages,' in the *Cyclopædia of Anatomy and Physiology*.

F. grow with great rapidity, and in some birds attain a length of more than two ft. They are almost always renewed annually, and in many species oftener; hence it may be conceived how much vital energy must be exhibited in their development, and how critical the period of moulting must be. The plumage is generally changed several times before it attains the state which is regarded as characteristic of the adult bird; these changes may occupy a period usually ranging from one to five years.

Notwithstanding their extravascular nature, F., as is well known, undergo a change of color after they are completely formed. In yearling birds, the winter plumage, which succeeds the autumnal moult, gradually assumes brighter tints, the new color commencing at the part of the vane nearest the body, and gradually extending outward till it pervades the whole feather. Dr. Weinland, an American naturalist, is of opinion, from a comparison of bleached specimens in museums, with recent ones taken from the bird, that the brightness and fading of the colors are due to the increase or diminution of an oily matter. Thus, the microscopic examination of the vane of F. from the breast of a fresh merganser showed numerous *lacunæ* containing a reddish oil-like fluid ; some weeks later, the same F. having become nearly white from exposure to light, disclosed air-bubbles instead of the reddish fluid. If this fluid is an actual oil, as is probably the case, it could make its way into the non-vascular tissue by mere physical imbibition; and on the varying quantities of this oil the variations of plumage would depend.

The property possessed by the plumage of most birds, of keeping the surface protected from moisture, is well known. This is due to two causes. Most birds are provided with an oil-gland at the base of the tail, whose secretion is distributed over the F. by means of the bill; and, additionally, the shedding of water is partly due to a thin plate of air entangled by the feathers.

The F. vary in form in different parts of the body, and afford zoological characters for distinction of species. Hence, they have received distinct names, such as primaries, secondaries, tertiaries, etc., in ornithology: see BIRDS.

The chief uses to which F. are applied in the arts are three—*pens*, because of the peculiar elasticity of the barrels; *bed-feathers*, because of the combined softness and elasticity of the barbs; and *ornament*, because of the graceful forms and delicate tints of the whole feather. For the mode of preparing the barrels for pens, see QUILLS.

Bed-feathers were used in England in the time of Henry VII.; but it is not known how much earlier. At present, goose-F. are preferred, the white rather than the gray. What are called *poultry* F., such as those of the turkey, duck, and fowl, are less esteemed, on account of their deficient elasticity. Wild-duck F. are soft and elastic, but contain an oil difficult to remove. The following is one among several modes of preparing F. for beds. Clean water is saturated with quicklime; the F. are put into a tub; the lime-water is added to the depth of a few inches; the F. are well steeped and stirred for three or four days; they are taken out, drained, washed in clean water, dried upon nets, shaken occasionally while drying, and finally beaten to expel any dust. The larger establishments, however, now prepare bed-feathers by steaming, which is found more profitable and efficient. The *down*, which is of so light and exquisite a texture as to have become the symbol of softness, is mostly from the breasts of birds, and forms a warm and delicate stuffing for beds, pillows, and coverlets. The most valuable is that from the eider-duck: see EIDER.

F. used for head-dresses, or other purposes of ornament, are selected for their forms and colors. The *ostrich*, a very valuable kind of feather, is an example of the way in which ornamental F. generally are prepared by the *plu-*

massier. The hunters endeavor to avoid injuring the F. by blood or blows: see OSTRICH. The F. are assorted according to quality; those from the back and above the wings are best, the wing F. next best, and the tail F. least valued. The F. of the male are rather more prized than those of the female. They are cleaned for use by repeated soakings and washings in water, sometimes with and sometimes without soap. There is also a process of bleaching by means of burning sulphur. When dried by being hung upon cords, the F. pass into the hands of the dresser, who opens the fibres by shaking, gives pliancy to the ribs by scraping them with bits of glass, and curls the filaments by passing the edge of a blunt knife over them. If the F., whether of the ostrich or any other bird, remain in the natural color, little more has to be done; but if a change of tint be required, the F. easily take dye-materials—such as safflower and lemon-juice for rose-color or pink, Brazil-wood for deep red, Brazil-wood and cudbear for crimson, indigo for blue, turmeric or weld for yellow, etc. A process of bleaching is adopted before the dyeing, except for black.

The kinds of F. chiefly used for ornament are those of the ostrich, adjutant, rhea or American ostrich, emu, osprey, egrett, heron, antrenga, bird of paradise, swan, turkey, peacock, argus pheasant, ibis, eagle, and grebe. White ostrich F. are prepared chiefly for ladies' head-dresses; and black for some military and some funereal trappings. The white and gray marabout-stork F., imported from Calcutta, are beautifully soft and light, and are in request for head-dresses, muffs, and boas; the white kinds will sometimes sell for their weight in gold. The flossy kinds of rhea feather are used for military plumes, and the long brown wing F. for brooms and brushes. Osprey and egrett F. are used mostly for military plumes by Hussar troopers. Bird of Paradise F. are much sought by oriental princes for turban-plumes. Cocks' F. are used for ladies' riding hats and for military plumes. Dr. Macgowan, U. S. consul at Ningpo a few years ago, described, in the *American Journal of Science and Art*, an ingenious process which the Chinese adopt for combining brilliant-colored F. with bits of colored metal into garlands, chaplets, frontals, tiaras, and other ornamental articles.

FEATURE, n. *fē'tūr* or *-chûr* [It. *fattura;* OF. *faicture*, the making or workmanship of a thing—from L. *factura*, a making: Norm. F. *faitura*, fashion, make—connected with *feat—lit.*, the make or workmanship of a thing]: the make, form, or cast of any part of the face; any single lineament; outline; prominent parts; outward appearance. FEA'TURED, a. *-tūrd*, having features. FEA'TURELESS, a. without features.

FEAZE, v. *fēz* [AS. *fæs*, a fringe; Ger. *fasen*, to ravel out]: to untwist the end of a rope; to unravel.

FEAZE, FEIZE, FEEZE, or PHEESE, v. *fēz* [Swiss, *fitzen;* Dut. *veselen;* F. *fesser*, to whip, to switch: Swiss, *fitzer*, rods for children]: in *OE.*, to whip; to chastise; to beat; to drive away. FEAZ'ING, imp. FEAZED, pp. *fēzd*.

FEBIGER, *fĕb′ĭ-gėr*, Christian: 1746–1796, Sep. 20; b. island of Fünen, Denmark: soldier. He received a military education, served on the staff of his uncle when gov. of Santa Cruz, travelled through the American colonies 1772, engaged in commercial business in New England, was adjutant of a Mass. regt. at Bunker Hill, was taken prisoner while serving under Arnold in the Quebec campaign, 1775, Dec. 31; became lieut.col. of a Va. regt. 1776, Nov., took part in the Penn. campaign, and was promoted col. for gallantry at Brandywine. At Germantown he commanded the right of Greene's wing, at Monmouth led a force of 4,000 men and two guns, and at Stony Point commanded the right column and personally captured the British commander. He retired from active service after Cornwallis's surrender, was brevetted brig gen. 1783, Sep. 30, and was treas. of Penn. from 1789, Nov. 13, till death

FEBRILE, a. *fē′brĭl* or *fĕb′* [F. *fébrile*, pert. to a fever—from L. *febrīlĭs*—from *febris*, a fever]: pertaining to a fever; indicating fever; feverish. Febricula, n. *fĕb-rĭk′-ū-lă* [L.]: a slight fever, called sometimes Ephemera (fever of a day): see Fever.—Feb′rifuge, n. *-rĭ-fūj* [L. *febris; fŭgō*, I drive away]: any medicine that mitigates or removes a fever (q.v.). Febris, n. *fē′brĭs* [L.]: fever.

FEBRONIANISM, *fē-brō′nĭ-an-ĭzm:* in Rom. Cath. theology, a system of doctrine antagonistic to the admitted claims of the Roman pontiff. and asserting the independence of national churches, and the diocesan rights of individual bishops in matters of local discipline and church government. The name is derived from the *nom de guerre*, Justinus 'Febronius,' assumed by John Nicholas von Hontheim, coadjutor archbishop of Treves, in a work on these subjects, entitled *De Præsenti Statu Ecclesiæ*, which he published 1767, and which, with its several successive volumes, led to a violent and protracted controversy, and elicited the severest censures of the Roman tribunals. See Hontheim: Gallican Church.

FEBRUARY, n. *fĕb′rô-ėr-ĭ* [L. *Febrŭārĭŭs*, the month of expiation—from *febrŭŭm*, an expiation]: second month of the year; having ordinarily 28 days, but in leap-year having an additional or intercalary day. Among the Romans, it had originally 29 days in an ordinary year, but when the senate decreed that the eighth month should bear the name of Augustus, a day was taken from February, and given to August, which had then only 30, that it might not be inferior to July. The name is derived from the fact that during this month occurred the Roman festival called the Lupercalia, and also Februalia, from *februare*, to purify.

FEBRUUS, *fĕb′rū-ŭs* [connected with Lat. *februare*, to purify]: ancient Italian divinity, whoso worship was celebrated with lustrations during the month of February. The ceremonies instituted in his honor were believed to have the effect of producing fertility in man and beast. F., whose name in the Etruscan language is said to have signified god of the lower world, was also worshipped as such by the Romans, and identified with the Greek Pluto.

FECAMP, *fā-kŏng':* manufacturing town and seaport of France, dept. of Seine Inférieure, in a narrow valley, flanked on either side by steep cliffs, at the mouth of a stream named F., same name on the English Channel, 23 m. n. e. of Havre. It consists mainly of one long street. Its principal building is the handsome church of Notre Dame, in the early pointed style, dating from the 14th c. The harbor is frequented by colliers from Newcastle and Sunderland, and by Baltic timber-ships and fishing-vessels. F. has cotton-mills, sugar-refineries, tanneries, ship-building yards, and some linen-cloth and hardware manufactures. Pop. 12,000.

FECES, FECAL, etc.: see FÆCES.

FECHTER, *fĕsh'tėr*, CHARLES ALBERT: actor of eminence: abt. 1823–1879, Aug.; b. London; son of a Frenchman. When only three or four years old, he went with his parents to France, and was educated as a sculptor; but his predilections were for the stage; and he soon became a popular actor. In 1860 he was announced to appear in an English version of *Ruy Blas* at the Princess's, London, and so perfectly identified himself with the character, that people almost forgot his French accent, in admiring the energy and finish of his acting. In the following year, Mar. 20, he appeared in the character of Hamlet. While abandoning the traditions of the English stage, F. showed himself capable of appreciating the difficulties that he had to contend with, and in some measure of surmounting them. The impersonation was, on the whole, one that marked him as an actor of very high powers. The same may be said of his representation of Othello. Subsequently F. became lessee of the Lyceum Theatre, playing the chief part in most of the pieces produced. In 1870 he made a successful visit to the United States, where he thenceforward remained, and where he died.

FECIAL, a. *fē'shal* [L. *fetialis*, a public officer employed in the declaration of war]: of or pertaining to the Fecials: N. in *Rom. antiq.*, one of a college of 20 priests, said to have been instituted by Numa, who presided over all the ceremonies connected with the ratification of peace or the formal declaration of war.

FECIT, v. *fē'sĭt* [L. he did it or made it]: a word inscribed on the work of a painter or sculptor after his name to indicate that 'he did it' or 'he made it.'

FECKLESS, a. *fĕk'lĕs* [Scot. *feck*, worth, power, value]: in *Scot.* and *OE.*, powerless; of no account; worthless.

FECULA, or FÆCULA, n. *fĕk'ū-lă* [L. *fæcŭlă*, salt of tartar deposited from wine—from *fæx*, dregs or sediment: F. *fécule*]: starchy powder obtained in great abundance from plants and their seeds, etc., by crushing and washing them, and allowing the matter to settle; starch—in France usually potato-starch (see STARCH): farina—also called *amylum*. FEC'ULENT, a. *-lĕnt* [F.—L.]: foul; muddy; abounding with sediment. FEC'ULENCE, n. *-lĕns*, or FEC'ULENCY, n. *-lĕn-sĭ*, the state or quality of being feculent; muddiness; sediment.

FECUND, a. *fĕk′ŭnd* [L. *fēcŭndŭs*, apt to bear young, fruitful: It. *fecondo:* F. *fécond*]: fruitful; prolific. **Fec′undate**, v. *-ŭn-dāt*, to make fruitful. **Fec′undating**, imp. **Fec′undated**, pp. **Fec′unda′tion**, n. *-dā′shŭn*, the act of making fruitful or prolific; impregnation. **Fecundity**, n. *fè-kŭn′dĭ-tĭ* [OF. *fecondité*—from L. *fecunditātem*, fruitfulness]: fruitfulness; the power of producing or bringing forth.

FECUNDA′TION, or **Fertiliza′tion**, in Plants: reproductive process according to laws similar to those which prevail in the animal kingdom. In plants, however, the organs of reproduction are not permanent as in animals, but fall off—the male organs generally soon after fecundation, the female after the ripening of the seed. The male seminal substance, called *pollen*, never exists in a fluid state, but always in that of granules of various forms (*pollen grains*), which consist each of one cell, whose covering is of various thickness, and contains the impregnating substance. After the dehiscence of the anthers, the pollen comes into contact with the stigma of the pistil, which in its lowest and thickest part (the *ovary* or *germen*) contains the rudiments of the future seeds (*ovules*). The inner layer of the cell-covering of the pollen grain separates from the outer and thicker layer, as if it came out of a bag, and continuing to be elongated by growth, is carried down through the *style* to the germen, where it reaches the *foramen* or small opening of the embryo sac, and comes into contact with the ovule, or even in many cases penetrates into the ovule itself between its cells. By this time, one or other of the cells of the ovule has become considerable more enlarged than the other cells, and what is called the *amnion* has been formed, in the mucilaginous fluid of which (*protoplasma*), after the contact of the pollen bag, through the dynamic operation of its contents, a *cell-germ* or *cytoblast* is soon developed. This cytoblast is the first commencement of a new and distinct cell, which divides into two cells. These increase, by continually repeated separation of new cells, into a cellular body, which forms the more or less perfect *embryo* of a new plant. If the organ from which the pollen has proceeded, and the organ which contained the ovule, belong to the same plant or to plants of the same species, the embryo arising from this fecundation becomes a plant of the same species. But if the pollen by which the fecundation is effected comes from a plant of another species than that to which the plant belongs in whose germen the embryo is formed, the seed resulting from this fecundation will not, when it grows, produce plants of the same species, but *hybrids*, intermediate between the parent plants, and with various degrees of resemblance to one or other of them, but not perfectly corresponding with either. Hence the production of hybrids, and multiplication of varieties of plants in gardens, by what is called the artificial impregnation of the stigma of one plant with the pollen of another, which, however, must be of an allied species, hybridization being confined by the laws of nature within very narrow limits.

See REPRODUCTION: PLANT: STAMEN: PISTIL: VEGETABLE PHYSIOLOGY.

FED, v. *fĕd:* pt. and pp. of FEED, which see.

FEDERAL, a. *fĕd'ĕr-ăl* [F. *fédéral*—from L. *fœdĕrālĭs*—from L. *fœdus,* a league or treaty]: pertaining to a league; consisting in a compact or agreement between nations, or between the several states of a nation, as in Switzerland or America: N. in *Amer.,* an advocate of the strengthening of the central government. FEDERACY, n. a confederation or union of several states under one central authority, consisting of delegates from each state, in matters of general polity, but self-governing in local matters. FED'ERALISM, n. *-ĭzm,* the principles of the federals. FED'ERALIST, n. a supporter of federalism; a federal. FED'ERALIZE, v. *-īz,* to league together. FED'ERALI'ZING, imp. FED'ERALIZED, pp. *-īzd.* FED'ERATE, a. *-āt,* united by compact. FED'ERA'TION, n. *-ā'shŭn* [F.—L.]: the act of uniting in a league; a league; a union for purposes of government. FED'ERATIVE, a. *-ā-tĭv,* joining in a league or contract; forming a confederacy.

FED'ERAL GOV'ERNMENT: central or national government administered by a union of states according to a compact binding all the states. When several states, otherwise independent, bind themselves together by a treaty, so as to present to the external world the aspect of a single state, without renouncing their individual powers of strictly internal self-government, they are said to form a Federation or Federal Union. The contracting parties are sovereign states acting through their representatives; and the extent to which the central overrules the local legislatures is fixed by the terms of the contract. In such degree or extent as the sovereignty of the several states is reduced, and the central power becomes sovereign within the limits of the federated states, the federation approaches to the character of a Union. The only renunciation of sovereignty which a federation as such necessarily implies, consists in abandoning the power which each separate state otherwise would possess of forming or conducting independent relations with foreign states. 'There are,' says Mr. Mill, 'two different modes of organizing a federal union. The federal authorities may represent the governments solely, and their acts may be obligatory only on the governments as such, or they may have the power of enacting laws and issuing orders which are binding directly on individual citizens. The former is the plan of the German so-called confederation, and of the Swiss constitution previous to 1847. It was tried in America for a few years immediately following the war of independence. The other principle is that of the existing constitution of the United States, and was adopted by Switzerland at the revision of the constitution 1874. The federal congress of the American Union is a substantive part of the government of every individual state. Within the limits of its attributions, it makes laws which are obeyed by every citizen individually, executes them through its own officers, and enforces them by its own tribunals. This is the only principle which has been found, or which is even likely to produce an effective federal government. A union between the governments only is a mere alliance, and subject to all the contingencies which render alliances precarious.'—*Representative Government*, pp. 301, 302. See CONFEDERATION: CONFEDERATION OF THE THIRTEEN AMERICAN COLONIES. One of the chief difficulties which arise in organizing a federal government, consists in discovering by what means disagreements between one or more of the local governments and the central government as to the limits of their respective powers, are to be disposed of. The arrangement by which this object was sought to be effected in America, of which M. de Tocqueville expressed his admiration, is thus explained by Mr. Mill: 'Under the more perfect mode of federation, where every citizen of each particular state owes obedience to two governments—that of his own state, and that of the federation—it is evidently necessary not only that the constitutional limits of the authority of each should be precisely and clearly defined, but that the power to decide between them in any case of dispute should not reside in either of the governments, or in any functionary subject to it, but in an umpire independent of both. There must be a supreme court of justice, and a system of subordinate courts in every state of the union, before whom such questions shall be carried, and whose judgment on them, in the last stage of appeal, shall be final. Every state of the union, and the federal government itself, as well as every functionary of each, must be liable to be sued in those courts for exceeding their powers, or for non-performance of their federal duties, and must in general be obliged to employ those courts as the instrument for enforcing their federal rights. This involves the remarkable consequence, actually realized in the United States, that a court of justice, the highest federal tribunal, is supreme over the various governments, both state and federal, having the right to declare that any new law made, or act done by them, exceeds the powers assigned to them by the federal constitution and, in consequence, has no legal validity.'—(P. 305.) 'The tribunals which act as umpires between the federal and state governments naturally also decide all disputes between two states, or between a citizen of one state and the government of another. The usual remedies between nations, war and diplomacy, being precluded by the federal union, it is necessary that a judical remedy should supply their place. The supreme court of the federation dispenses international law, and is the first great example of what is now one of the most prominent wants of civilized society, a real international tribunal.' Mr. Mill's confidence in this remarkable tribunal, in which, de Tocqueville shared, has been historically justified. The wild attempt at secession, involving the great rebellion of 1861, was due to no defect in the organic bond, which, as the result proved, was so strong as to be unbreakable: but was due to an exceptional and inherited element of discord

—slavery—which was cut out by the sword, leaving the federal government stronger than before.

FEDERALIST, *fĕd'ĕr-al-ĭst,* The: collection of 86 essays written anonymously over a common signature, *Publius,* by Alexander Hamilton, James Madison, and John Jay, and addressed to the 'People of the State of New York.' The purpose of the essays was to secure the adhesion of N. Y. to the federal constitution proposed by the convention of 1787, Sep. 17, and excepting the last 9 all were published in *The Independent Journal,* semi-weekly newspaper of New York, 1787, Oct. 27—1788, Apr. 2. The essays were first published in book form, 2 vols. 12mo, 1788, and have been republished many times. A peculiar historical value is attached to the collection, as they are held to present most fully the views of the framers of the constitution on the necessities of the day and the requirements of the government in the future. Much curious speculation has been indulged concerning the authorship of the several essays.

FEDERALISTS: see Political Parties.

FEDERAL THEOLOGY: system resulting from endeavors to compress Christian doctrine within the limits of certain covenants conceived of as made between God and man, and between the Father and the Son in the Eternal Godhead: see Covenant, in theology.

FEE, n. *fē* [AS. *feoh;* Icel. *fe,* cattle, money: Dut. *vee.* cattle: Goth *faihu,* cattle, property—connected with *fief* and *feudal*]: price paid for service—generally said of professional men; reward or recompense; any land or tenement held of a superior on certain conditions: V. to pay a fee to; to engage in one's service; to hire. Fee'ing, imp. retaining by a fee; in *Scot.,* hiring for service. Feed, pp. *fēd,* retained by a fee, as a lawyer. Feer, n. *fē'ĕr,* one who holds a fee, or in fee, as an estate or property. Retaining-fee, the fee paid to a lawyer to secure his services. Fee-farm, land held by the payment of rent. Fee simple, an estate in lands or tenements of which the owner has the fullest power of disposing which the law allows (see Fee, Estate in). Fee-tail, a limited inheritance; an estate handed down by entail (q.v.). Fee and Life'rent, in the *law of Scotland,* the first the full right of proprietorship, the second the limited right of usufruct during life. These may be held together, or may coexist in different persons at the same time. Fee-fund, in *Scotland,* fund arising from the payment of dues of court on the tabling of summonses, the extracting of decrees, and the like, applied to payment of the clerks and other inferior officers of the court. This duty, since the act of 1868, is collected by stamps.

FEE, Estate in: largest estate in land in point of quantity of estate known to the law of England, being a freehold (q. v.) of inheritance. Estates in fee are divided into fee-simple and fee-tail. A fee-simple is defined by Littleton (1. a.) to be a lawful and pure inheritance. In order to create an estate in fee-simple by deed, it is necessary that the word heirs should be used; for a gift by deed to a man for ever, or to a man and his assigns for ever, creates only an estate for life. But words of perpetuity annexed to a gift to a man by will are construed as carrying an estate in fee. The proprietor of an estate in fee-simple enjoys the fullest rights of property over his estate, which he may alienate or burden at pleasure, and out of which he may grant estates of a lower kind, as for life or years. He is owner of the soil '*a cœlo usque ad centrum,*' and is therefore entitled to every product of the land, as timber, etc., and to all minerals and other valuable productions found beneath the surface. On his death, the estate descends to his right heirs, except in the case of fees held by corporations, which descend to their successors in office. Where a man claims an estate in fee-simple in possession in a corporeal hereditament (q.v.), he is said to be 'seized in his demesne as of fee.' Estates in fee-simple are divided into fee-simple absolute, qualified or base, and conditional. A qualified or base fee differs from a fee-simple absolute by having a qualification annexed which may determine the estate, as where it is granted to a man and his heirs 'tenants of the manor of Dale.' If, therefore, at any time the holder of the estate ceases to be the tenant of Dale, the estate, which depended on that qualification, determines.

A *conditional fee* was limited to a particular class of heirs, to the exclusion of others, as to a man and the heirs-male of his body. On failure of heirs-male of the body of the grantee, an estate of this kind reverted to the grantor or his heirs. In interpreting this law confusion arose, and by the famous statute *De Donis Conditionalibus* (13 Ed. I. c. 1), it was enacted that estates should be held *secundum formam doni.* Estates created by this statute were called estates in *fee-tail.* See ENTAIL.

The original mode of transferring an estate in fee was by feoffment (q.v.), but the statute of Frauds (29 Char. II. c. 3) requiring that writing should be used in all transfers of land, estates in fee must now be conveyed by deed or will.

The proprietor of an estate in fee-simple in the present day is substantially absolute owner of the freehold, which he holds without owing duty or service to any one, except the allegiance due to the sovereign, or civil power. But originally this was not so; an estate in fee is in its nature a feudal benefice, a feud, and the owner of the fee held his estate subject to all the services incident to the feudal state. But these duties, which never existed in the United States, have been by degrees entirely abolished in England: see FEUDAL SYSTEM: TENURES. In Scotland, the feudal usages in regard to land are still retained to a very great extent. See Paterson's *Compendium of English and Scotch Law.* An estate in fee in Scotland must be held by one of the three existing tenures—viz., feu, blanch, or burgage, and is subject to the casualties (q.v.) attaching to these rights.

FEEBLE, a. *fē'bl* [OF. *fleble* and *foible;* F. *faible,* weak. It. *fievole,* feeble—from mid. L. *flebĭlĭs,* infirm]: deficient in energy; weak; infirm; faint: imperfect; slender: V. in

OE., to enfeeble; to make weak. Feebled, pp. *fē'bld*, made weak. Fee'bly, ad. *-blĭ*, in a feeble manner; weakly. Fee'bleness, n. *-bl-nĕs*, want of strength. Feeble-minded, weak of mind; wanting in resolution.

FEED, n. *fēd* [AS. *fedan*, to feed, to bring up: Sw. *fada;* Dan. *föde*, to feed, to give birth to: comp. Gael. *fiadh*, meat, food (see Food)]: a certain quantity of food eaten at one time; a certain allowance of food given at one time, as to a horse or cow: V. to supply with food; to furnish with a supply of anything constantly required; tonourish; to keep in hope; to take food; to pasture or graze. Feed ing, imp. N. act of eating or giving food to; pasture. Fed, pt. and pp. *fĕd*, furnished with food; nourished. Feed-cloth, n. in *fibre*, the apron which leads the cotton, wool, or other fibre into the cleaning, lapping, carding, spinning, or other machine. Feed-cutter, a machine for cutting straw, hay, or cornstalks into short feed or chaff. Feed-hand, n. in *gear.*, a rod by which intermittent rotation is imparted to a ratchet-wheel. Feed-head, in *steam-eng.*, a cistern containing water and communicating with the boiler of a steam-engine by a pipe, to supply the water by the gravity of the water, the height being made sufficient to overcome the pressure within the boiler. Feed-heater, in *steam*, a drum or chamber in which feed-water for the boiler is heated by the exhaust steam. Feed-motion, contrivance in a machine by which the material under treatment is advanced or fed to the machine. Feed-pipe, a pipe leading from the water-source to the bottom of a boiler, generally of a steam-engine. Feed-pump, a force-pump driven by hand, or by donkey-engine, or by the engine itself, for supplying to the boiler a quantity of water equal to that removed in the form of steam. Feed-screw, in *turn.*, a long screw employed to impart a regular motion to a tool-rest or to the work; as the feed-screw in the bed of a lathe, which moves the screw-cutting tool. Feed wheel, a continuously or intermittingly revolving wheel or disk which carries forward an object or material. Feed of a lock, in *hydraul. eng.*, the amount of water required to pass a boat through a canal lock. Feed'er, n. he or that which feeds or supplies, in *OE.*, promoter or encourager; one who eats.—Syn. of 'feed, v.'. to cherish; foster; nurture, supply; satisfy; graze; prey; pasture.

FEEJEE: see Fiji.

FEEL, v. *fēl* [AS. *felan;* Ger. *fühlen;* Dut. *voelen*, to feel: Icel. *fialla*, to touch softly with the palm of the hand]. to perceive or search after by the touch; to experience; to try; to suffer or enjoy; to be affected by; to have the sensibility excited, to have the passions moved: N. sense of feeling; touch. Feel'ing. imp.. Adj. expressive of great sensibility; easily affected or moved: N. sense of touch perception; emotion; tenderness or sensibility of mind (see Emotion). Felt, pt. and pp. *fĕlt*, perceived; be affected by. Feel'er, n. he or that which feels. Feel'ers, n. plu. *-ĕrz*, any long sensitive organs, like the antennæ of insects or the whiskers of a cat. Feel'ings, n. plu. nice sensibilities. FEEL'INGLY, ad. *-lĭ*, tenderly; in a manner to be sensibly felt. TO FEEL AFTER, to search for; to seek for in order to find.—SYN. of 'feeling': sensation; susceptibility; sense; passion; consciousness; sentiment; opinion; agitation.

FEER: see under FEE.

FEER, or FIER, v. *fĕr* [AS. *fyrian*, to make a furrow]: in *Scot.*, to mark out the breadth of ridges with the plow. FEER'ING, imp. and n. FEERED, pp. *fĕrd.*

FEER, or FERE, n. *fĕr* [AS. *gefera*, a companion: Gael *fear*, a man, a husband: L. *vir*, a man]: in *OE.*, one who *fares*, or goes with another; in *Scot.* and *OE.*, a companion; a wife; a lover. IN FEER, together; in company.

FEES, of Lawyers and Physicians. In England, neither barristers nor physicians could recover their fees by legal proceedings against their clients or patients, except under a special contract. The ground of this rule was that such fees are regarded not as payment, but as an expression of gratitude for services the value of which cannot be appreciated in money, and for which a certain sum cannot be demanded without wrong to the claimant's reputation. The origin of the rule in the case of advocates (in regard to whom it is still in force), is traced to the relation between patrons and their clients in ancient Rome. When the former appeared as the defenders of the latter, they practiced, as Blackstone says (iii. 29, Kerr's ed.), *gratis*, for honor merely, or at the most for the sake of gaining influence. The rule at Rome was maintained even under the emperors; and Tacitus mentions (*Ann.* lib. ii. c. 5) that it was directed by a decree of the senate that these *honoraria* should not in any case exceed 10,000 sesterces, or about £80 of English money. It has further been decided in England, that no action lies to recover back a fee given to a barrister to argue a cause which he did not attend (Peake, 122). But special pleaders, equity draftsmen, and conveyancers, who have taken out certificates to practice under the bar, and therefore are not counsel, may recover their reasonable charges for business done by them (Poucher *v.* Norman, 3 B and C., 744). Another rule with reference to the fees of barristers and advocates is, that they are paid before they are earned; thus removing from legal practitioners all pecuniary interest in the issue of suits.—As regards physicans, the rule that a fee could not be recovered by an action at law, was applied in the case of Chorley *v.* Bolcot, 1791, June 30 (4 T. R. 317). If, however, either a barrister or a physician acted under a special agreement or promise of a certain payment, then an action might be brought for the money. But all medical practitioners were relieved from the above code of honor by the act of 21 and 22 Vict. 90, which applied to the United Kingdom, and enabled them to recover in any court of law their reasonable charges as well as costs of medicines and medical appliances used. This rule applies to physicians, surgeons, and apothecaries as defined by the statute. Members of the inferior branches of both professions—attorneys, solicitors, etc., on the one hand, and surgeons, dentists, cuppers, and the like on the other—were always entitled to raise action for their fees. In Scotland, the same rules prevail as in England with reference to both professions. In France, though the delicate sense of honor of the bar has always been preserved with quite as much care as in England, the rule is somewhat different. In law, an action for the recovery of fees would be maintainable in that country by an advocate; but 'in Paris, the rule of the ancient bar, founded on the disinterestedness which was its characteristic, and according to which any judicial demand of payment of fees was strictly forbidden under pain of erasure from the table (of advocates), has been religiously preserved.'—*History of the French Bar*, by Robert Jones, 1855. The practice in France seems to be for the fees of advocates to be paid afterward, though any bargain with the client or his agent that their amount shall depend on the issue of a trial, is regarded as dishonorable; and on several occasions the bar has vehemently resisted regulations, calling on them to acknowledge receipt of their fees, as wounding their sensibility.

In the United States, all practitioners of the healing art, who have duly complied with the laws in respect to license, registration, etc., whether physicians, surgeons or apothecaries, can sue for their fees. The view that a physician's services are purely honorary does not, and never did prevail In the absence of a specific agreement as to the amount of compensation, the physician will be entitled to what is termed a 'reasonable' fee. This means such just, and fair pay as is charged for similar services by other physicians of like standing and capacity. If prior dealings have taken place between the parties and no new agreement is made in respect to fees, the former rate is presumed to continue.

In respect to lawyers, the English distinctions between barristers and attorneys do not exist. All members of the profession stand upon the same legal footing. Neither law nor custom forbids an American lawyer from suing for his charges. As in the case of physicians, such charges, where no agreement has been made regulating them, must be reasonable and proportioned to services actually rendered.

FEET, n.: plu. of FOOT, which see.

FEFT, v. *fĕft*, for INFEFT [see ENFEOFF]: in *Scot.* and *OE.*, for *enfeoffed:* to put in possession of a property with the legal formalities.

FEHÉRVÁR (SZÉKES)—the Latin *Alba Regia*, German *Stuhlweissenburg*: one of the most ancient royal free towns of Hungary; in a marshy district about 40 m. s.w. of Pesth. Under the Arpádian kings, it was the metropolis of the realm, and the residence of the sovereigns, many of whom have been crowned and buried there. On many occasions, the diets also were held in F., where 12 kings—among which are St. Stephen, and the great Mathias Corvinus—lie buried. It is the seat of a bishop, and its people are chiefly Rom. Catholics, and all of the Magyar race. Water is supplied by an artesian well. Pop. (1880) 25,612.

FEHMIC COURTS, or Fehmgerichte: see Femgerichte.

FEIA, *fā-ē'a:* large lake of Brazil, on the maritime border of the province of Rio Janeiro, 150 m. n.e., from the city of Rio Janeiro. It is so near to the Atlantic that it has been connected with it by a canal. F. is about a degree n. of the southern tropic.

FEIGN, v. *fān* [F. *feindre;* OF. *feigner*, to dissemble—from L. *fingĕrĕ*, to form, to contrive—*lit.*, to form, contrive, or invent]: to make a show of doing; to assume or pretend; in *OE.*, to relate falsely. Feign'ing, imp. inventing; pretending: N. a false appearance; an artful contrivance. Feigned, pp. *fānd.* Feign'er, one who. Feign'edly, ad. *-ĕd-lĭ*, in pretense; not really. Feint, n. *fānt* [F. *feinte*, a pretense]: a pretense; a false appearance; a mock attack; the appearance of aiming at or offering when something quite different is intended. Feigned-issue, n. in *law*, proceeding in law whereby an action is supposed to be brought by consent of the parties, to determine some disputed right, without the formality or expense of pleading (see Fencing).—Syn. of 'feign': to simulate, dissimulate; imagine; contrive; represent; counterfeit; dissemble; conceal.

FEIGN'ING OF DISEASE': practiced somewhat in the army and navy, also by convicts and others anxious to escape from discipline, or procure a discharge from compulsory service. In the army, it is technically called *malingering.* The detection of feigned disease belongs to the educated physician, and is impossible without a thorough knowledge of the reality, unless, indeed, the imitation be very coarse. The diseases most frequently simulated are epilepsy, catalepsy, convulsions, blindness, deafness, palsy, insanity, indigestion, neuralgia, rheumatism, palpitation of the heart, and generally all disorders which may exist without leading to any distinct external appearances. Ulcers of the legs, however, have often been made, and kept open artificially through the application of irritant substances; and vomiting or coughing up of blood is very easily simulated, if the supposed patient can get access to the necessary materials in the slaughter-house or elsewhere. Many men in the public services, and women affected with hysteria, have become so expert as to deceive even men of high character and skill. An instance is on record in which a man submitted to successive amputations of the arm upward, nearly to the shoulder, for an ulcer produced and kept open at will by local applications; and a case was some time ago recorded by Dr. Murchison in the *Medico-chirurgical Transactions*, in which there is no reasonable doubt that a large opening into the stomach was the result of caustic substances deliberately applied to the abdomen, with the view of exciting sympathy.

FEITH, *fīt*, Rhijnvis: 1753, Feb. 7—1824, Feb. 8; b. Zwoll, in Overyssel: Dutch poet, ranking next to Bilderdijk (q.v.) as a reviver of the national poetry. He studied law at Leyden, and returned to his native town 1776, where he held the office of burgomaster. F. tried almost all kinds of poetry. In his earlier productions, he showed excessive inclination for the sentimental; but in 1792 appeared his *Het Graf* (The Tomb), a didactic poem, which, though not free from the weakness referred to, is on the whole happily conceived, and contains some admirable passages. His *De Ouderdom* (Old Age), 1802, is deficient in plan. Among his lyrical pieces, *Oden en Gedichten* (Odes and Miscellaneous Poems, 4 vols. Amst. 1796–1810), are several marked by enthusiasm and warmth of feeling. Of his tragedies, the best known are *Thirza* (1791), *Johanna Gray* (1791), and *Ines de Castro* (1793). Together with Bilderdijk, he recast in nobler form Haren's famous patriotic poem, *De Geuzen* (Les Gueux, or the Beggars), which celebrates the first struggles of the Dutch for independence. Of F.'s prose works, the most important are *Brieven over verscheiden Onderwerpen* (Letters on Different Subjects, 6 vols. Amst. 1784–90). These Letters, by their polished style and refined criticism, did much to improve the literary taste of Holland.

FEKE, *fēk*, Robert: abt. 1725–1769; b. Oyster Bay, L. I.: artist. He was captured and taken to Spain while a boy, developed a natural ability for painting, and earned with his brush his passage to the United States. He settled in Newport, became a portrait painter as early as 1746, and died in the W. Indies. Specimens of his work are owned by Bowdoin College, the R. I. Hist. Soc., and Redwood Library, Newport.

FELANITCHE, *fā-lâ-nē'chā*, or Felanitz, *fā-la-nĕch'* (anc. *Canatix*): town of the island of Majorca; 27 m. e.s.e. from Palma. It is in a valley, surrounded by mountains, and is well built, with a number of squares and wide streets. It has a convent and a hospital. On a neighboring hill is an ancient Moorish castle, with subterranean vaults. Linen and woolen fabrics are manufactured; rope-making and brandy-distilling also are carried on. There is some trade in the products of the neighboring country—rice, coffee, sugar, wine, brandy, fruit, and cattle. Pop. 11,018.

FELAPTON, n. *fĕl ăp'ton* [a mnemonic word]: in *logic*, an arbitrary name for a mode of syllogisms in the third figure, in which the middle term is made the subject of the major and of the minor premise. By this mode we arrive at a particular negative from a universal negative and a universal affirmative. Example: FEL, No A is B. AP, All A is C. TON, Some C is not B.

FELDMANN, *fĕlt'mân*, Leopold: 1802, May 22—1882, Mar. 26; b. Munich; of Jewish parents to whose faith he always adhered: German writer of comedies. Apprenticed 1815 to a saddler, afterward to a cobbler, he sent, in a pair of shoes which he had mended, a poetical expression of his devotion to their fair wearer. For this his master sent him back to school, where 1817, when only 15 years old, he wrote a play, *Der Falsche Eid* (The False Oath), which was actually produced on the stage. After a few years in business at Pappenheim, and subsequently in Munich, he was induced, by the reputation which he gained from some humorous pieces, entitled *Genrebilder*, to apply himself entirely to literature. In 1835, his *Höllen-lieder* (Hell-Songs) appeared; and his first comedy, *Der Sohn auf Reisen* (The Son on his Travels), was acted in Munich with applause. While travelling thereafter for five years, chiefly in Greece, he wrote *Pictures of Travel* for Lewald's *Europa*, and the correspondence for the *Allgemeine Zeitung*. In 1841, his comedy was produced in Vienna, and he was histrionic teacher in the National Theatre of that capital 1850–54. F.'s works, which are numerous, are reckoned among the best specimens of modern Germany comedy, pleasing by their cheerful humor, and happy employment of contemporary ideas and events, though deficient in artistic finish. F. published a collection of his comedies, *Deutsche Originallustspiele* (1844–52; new series, 1855–57).

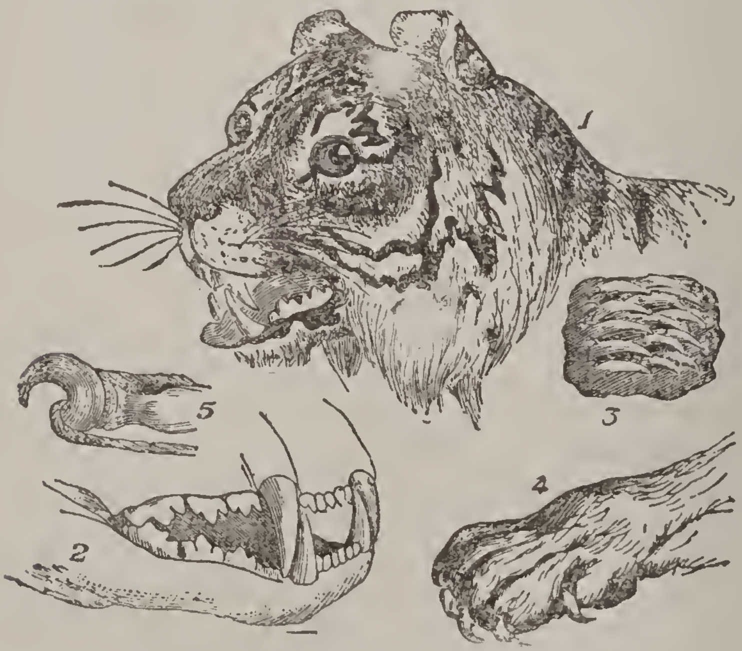
FELDSPATH, n. *fĕl'spăth*, or FELDSPAR, n. *fĕl'spâr:* other spellings of FELSPAR, which see. FELDSPATHIC, a. *fĕl-spăth'ĭk*, pertaining to felspar.

FELEGYHAZA, *fā-lĕdj-hâ'zŏh:* town of Little Cumania, Hungary, on the railway between Pesth and Temesvar, 67 m.s.e. from Pesth. It has extensive trade in grain, fruit, wine, tobacco, and cattle. In the neighbourhood, several Roman urns have been found. Pop. (1880) 23,912.

FELICITATE v. *fé-lĭs'ĭ-tāt* [F. *félicité*—from L. *felĭcĭtātĕm*, happiness—from *felix*, happy: It. *felicita*]: to congratulate on a supposed increase of happiness; to express joy or pleasure at: ADJ. in *OE.*, made happy. FELIC'ITATING, imp. FELIC'ITATED, pp. FELIC'ITA'TION, n. *-tā'shŭn* [F.—L.]: congratulation. FELIC'ITOUS, a. *-tŭs*, very happy; delightful; very appropriate. FELIC'ITOUSLY, ad. *-lĭ*. FELIC'ITY, n. *-ĭ-tĭ* [F. *félicité*]: great happiness; bliss; the joys of heaven.—SYN. of 'felicity': happiness; beatitude; blessedness; blissfulness; blessing; prosperity.

FELICU'DI: see LIPARI ISLANDS.

FE'LIDÆ, or FELI'NÆ: family of digitigrade carnivorous quadrupeds (see CARNIVORA: DIGITIGRADA), corresponding to the genus *Felis* of Linnæus, and sometimes collectively called *cats* or the *cat tribe*. They are, generally speaking, the most carnivorous of all the *Carnivora*, holding the same relative place among quadrupeds that the *Falconidæ* do among birds. Their organization is admirably suitable to their habits. They have a very lithe muscular frame; the body is rather long, and remarkably flexible; the limbs generally short. Few of the species possess much fleetness, but most of them excel in climbing and in leaping. When moving rapidly over the surface of the ground, they generally advance by a series of zigzag bounds, rather than by direct running. They are mostly inhabitants of forests, and many even of the larger species live much among the branches of the trees, though some of the largest do not leave the ground. They all advance stealthily on their prey, which all of them kill for themselves, and devour in a perfectly fresh state, and generally while still warm and quivering. When they have approached within a sufficient distance, they complete the seizure by a spring, many of them uttering a roar or yell as they do so, and thus rendering their victory more secure by the consternation which paralyzes the object of their attack. Their movements are extremely noiseless, owing to the soft velvety pads with which their toes are provided. Their claws are strong, much curved, very sharp, and retractile; being withdrawn by special muscles and ligaments into sheaths when not in use, and their points even turned upward, so that they are not blunted by unnecessary friction, and do not interfere with the movements of the animal by accidentally hooking objects which are in the way. The last bone (*phalanx*) and joint of the toe exhibit peculiarities requisite for the extension and retraction of the claws. The fore-feet have five toes, the hind-feet four. The head of the F. is characterized by great breadth of skull, while the muzzle is short, and sometimes even rounded; the jaws are moved by very powerful muscles, and the articulation of the lower jaw is such that it has no rotatory motion; the teeth also being so shaped, and those of the two jaws so fitting to each other, that they cut like scissors—the lower teeth shutting within the upper—and are not at all adapted to the trituration of food. There are six small incisors in each jaw, followed on each side by one very large canine tooth, adapted for prehension; and this is followed by two præmolars, or false molars, which, particularly in the lower jaw, are compressed and sharp-edged, their edges rising to a central summit, with inferior lateral cusps, so that flesh between them is subjected to a cutting action in various directions. Finally, there is on each side of each jaw one true molar, and in the upper jaw of many species, a second true molar. The crowns of all the teeth are covered with enamel. The



Characteristic Features of the Felidæ:
1, tiger's head; 2, showing the dentition; 3, portion of tongue; 4, right fore paw, showing claws; 5, claw, showing tendons.

tongue is rough, with horny papillæ directed backward, by which it is fitted for cleaning the bones of the prey. The stomach is simple, the intestines short, and digestion rapid. The senses of sight and hearing are extremely acute; the eyes are adapted to seeing both by day and by night; the sense of smelling also is very acute, though apparently not equal to that of dogs; the sense of taste is supposed to be less acute; the bulbs from which the long whiskers arise appear to possess the sense of touch in great perfection, and the whiskers thus become useful in the progress of the animal through entangled thickets.

The F. agree so much in form and structure, that many naturalists still refuse to divide the Linnæan genus *Felis*. None of the F. are gregarious. Almost all, when taken young, seem capable of domestication, but in general they are little to be trusted. The species are numerous. They are distributed over Europe, Asia, Africa, America, and the islands adjacent to these continents; but none are found in Australia, where their place is supplied by the carnivorous marsupial quadrupeds. The largest species are found chiefly in warm climates. No species is known to be common to the Old and New worlds, though some are very nearly allied.

Vast numbers of the larger F. were brought from Africa and the East for those savage sports and shows in which the ancient Romans delighted. 500 lions were slain in five days at the opening of Pompey's theatre, and 500 panthers have been let loose at once in a similar Roman arena. The wealth of Indian princes has often been spent in fights of such beasts.

For the principal F., see Lion: Tiger: Jaguar: Puma: Leopard: Panther: Cat: Tiger cat: Lynx: Cheetah: Ounce: Caracal: Serval: Ocelot, etc.

FELINE, a. *fē′līn* [F. *félin*—from L. *felīnus*, belonging to a cat—from *fēlĭs*, a cat: It. *felino*]: pertaining to the cat kind; like a cat. Felidæ, n. plu. *fē′lĭ dē*, the cat family, including the lion, tiger, and cat. Felis, n. *fē′lĭs*, a Linnæan genus of animals corresponding with Felidæ.

FELIX, *fē′lĭks* I., Pope of Rome: d. prob. 274 (ruled prob. 269–prob. 274); reckoned the 26th in the succession of popes: succeeded Dionysius in the see of Rome. His pontificate is interesting chiefly as an early example of the relations of the Christian Church to the Roman empire, and of the recognition by the state of the civil rights of Christians. In the pontificate of Felix's predecessor Dionysius, Paul of Samosata, Bp. of Antioch, had been deposed by a council held in that city. Paul having resisted the sentence, the matter was laid before Felix, Dionysius being now dead; and, as Paul held possession of the church and church buildings, the bishops were obliged to claim the interference of Emperor Aurelian, who was passing through Antioch on his return from Palmyra. Aurelian returned a decision often appealed to in modern controversy, to the effect that the buildings should belong to the person 'to whom they should be adjudged by the bishops of Italy and Rome.' Felix afterward suffered martyrdom in the persecution of the same emperor, Aurelian.

FELIX II., Pope of Rome: occupied the Roman see during the banishment of Liberius, 355. It is agreed on all hands that his first appointment was intrusive, but much diversity of opinion exists as to his subsequent career. In reply to a petition for the recall of Liberius, it was proposed by Emperor Constantius that Liberius and Felix should exercise jurisdiction jointly; but this proposition was rejected by the Romans, and Felix appears to have been compelled to retire from the city. According to the *Liber Pontificalis*, he suffered martyrdom in the end, at the hands of his former patron, Constantius; but this is not confirmed by any contemporary authority.

FELIX III., Pope of Rome: b. Rome, of the family from which afterward sprang Pope Gregory the Great; d. 492, Feb. 24 (ruled 483–492). His pontificate is historically memorable, as presenting the commencement of the disruption of the Greek and Roman churches. The contemporary occupant of the see of Constantinople, Acacius, as well as the imperial court, was a favorer of the Monophysite party, who refused to accept the decision of the council of Chalcedon: see MONOPHYSITES. By their influence, the patriarch of Alexandria was deposed, and replaced by the monophysite Peter Mongus. The deposed patriarch having appealed to Rome, Felix sent two legates to Constantinople, to require his restoration; and the legates having failed in their trust, and Acacius still adhering to the heterodox party, Felix assembled a council at Rome, and excommunicated not only the offending legates, but also Acacius himself, the sentence being pinned by a monk upon the back of the patriarch's robes while he was actually officiating in the church. Felix had previously rejected the *Henoticon*, or Decree of Union, published by Emperor Zeno. The schism thus inaugurated was not healed till 519. The only literary remains of this pontiff are the letters and other acts of this controversy.

FELIX IV., Pope of Rome: b. Benevento; d. 530 (ruled 526–530); successor of John I. His pontificate presents no noteworthy event.

FELIX V. (anti-pope): see AMADEUS.

FELIX, ANTONIUS: a Roman procurator of Judæ (51–62 A.D.) in the time of the Apostle Paul, was a freedman of the Emperor Claudius I. The circumstances under which he received his appointment are related differently by Tacitus and Josephus. His government, politically considered, was in some respects good. According to Josephus and other authorities, he cleared the country of robbers, and vigorously suppressed the chaotic seditions of the Jews; but his cruelty, lust, and greed were unbounded. His wife was Drusilla, a beautiful but renegade Jewess, whom he had induced to abandon her first husband, and to form a questionable connection with himself. It was therefore not at all wonderful that F. should tremble, as Paul reasoned of 'righteousness, temperance, and judgment to come' (Acts xxiv. 25). He was recalled to Rome, 62 A.D., on account of the accusations preferred against him by the influential Jews of Cæsarea, and narrowly escaped the sentence of death.

FELIXIANS, *fē-lĭk'sĭ-anz:* Spanish sect of the latter part of the 8th c., so-called from Felix, Bp. of Urgel. See ADOPTIAN CONTROVERSY.

FELL, v. *fĕl:* pt. of FALL, which see.

FELL, a. *fĕl* [It. *fello;* OF. *felle*, fierce, cruel: L. *fel*, gall: Gael. *feall*, treachery: W. *gwal*, defect]: cruel; barbarous; fierce; dreadful: N. in *OE.*, gall. FELL'NESS, n. cruelty; savageness; fury. FEL'LEST, a. superl. very cruel; most barbarous. FELLY, ad. *fĕl'lĭ*, in a savage manner; inhumanly.

FELL, v. *fĕl* [Icel. *fella;* Dut. *vellen*, or *velden*, to fell or cause to fall]: to bring to the ground; to knock down; to hew or cut down. FEL'LING imp.: N. the act of one who cuts down trees. FELLED, pp. *fĕld.* FEL'LER, n. one who.

FELL, v. *fĕl* [Gael. *fill*, to fold, to plait: Sw. *fall*, a hem]: to turn down, as a seam: N. in *weaving*, the end of a web formed by the last thread of the weft.

FELL, n. *fĕl* [Goth. *fill;* Icel. *fell;* Dut. *vel;* L. *pellis*, skin]: a skin or hide. FELL'MONGER, n. a dealer in hides.

FELL, n. *fĕl* [Icel. *fjall*, or *fell;* Dan. *field*, a mountain —originally an open flat down]: a low-browed hill; a mountain; a mountain-side; in *OE.*, a moor; an elevated bleak tract. SHEEP-FELL, in *OE.*, an elevated open flat for sheep.

FELLAH, n. *fĕl'lă*, FEL'LAHS, or EL FEL'LAHIN, n. plu. *lă-hēn* [Arabic word meaning peasant or agriculturist]: specially applied to the peasant tillers of the soil in Egypt by the Turks, in a contemptuous sense, as 'clowns,' or 'boors.' There seems a curious coincidence between *fellah* and the accepted etymology of *fellow*. They form the great bulk of the population, and are descendants of the ancient Egyptians, intermingled with Syrians, Arabs, and other races who have been converted to Islam. In their physical conformation and features, they differ among themselves, those of the n. provinces of the Mediterranean being of whiter hue, while at Assouan they are almost black. They are described as having a large skull, facial angle almost 90 degrees, oval face, arched eyebrows, deep eyes, projecting lips, large mouth, thin beard, short nose, large chest, and small belly; arched back, and small hands and feet, and being of mean height. They form the fourth class of the population, and are distinguished from the Bedouin or free Arabs, who have entered the country later than the Saracenic conquest, and the Arabs of the town and villages. Their dress consists of a shirt and linen drawers, over which is a larger blue shirt (*herie*), girdled by a leather or stuff belt, which is exchanged in winter for a coat with sleeves (*zabout*). On their head they wear the *tarboush*, turban, or a black or gray cap; the women tattoo themselves, and are nubile at an early age, being often married at 11 years, mothers at 12, and grandmothers at 24. The food of the Fellahin consists entirely of vegetables, which they eat in a crude state, dhourra bread, and beans. Even rice is too dear for them, and animal food unattainable. Their drink is limited to the waters of the Nile and coffee, and the only luxury which they enjoy is the green tobacco of the country; yet on this diet they are robust and healthy, and capable of much labor and fatigue. In their social position they are inferior to the Bedouin, who, though they will marry the daughters of the Fellahin, will not give to them their own in marriage. They appear to exhibit the moral qualities of the ancient Egyptians, being intelligent, grave, and calm, docile, pliable, and sober on the one hand; and idle, jealous, quarrelsome, satirical, licentious, and of unbending obstinacy on the other, and inherit the traditional hatred of their ancestors to the payment of taxes, which are often extorted only by the bastinado. Their political condition is most miserable. Each village is governed by a Sheik-el-Beled, responsible to the Nazirs and Mamours, or district officers, for the conduct of the inhabitants, and their due payment of taxes. So oppressive, indeed, is the taxation and extortion, scarcely one-twentieth of the produce falling to their lot, that it would not be possible for them to live if it were carried to a higher pitch, and none cultivate the lands with diligence unless compelled by their superiors —Gliddon, *Types of Mankind*, p. 319; Lepsius, *Egypt and Ethiopia*, p. 76; Lane, *Manners and Customs of Modern Egyptians*, pp. 125, 126, 192, 193; Clot Bey, *Aperçu générale*, I., pp. 159, 160.

FELLA'TAHS, or FOU'LAHS: see FULAHS.

FELLENBERG, *fĕl'ĕn-bĕrg*, Gr. *fĕl'ĕn-bĕrch*, PHILIP EMANUEL VON: 1771–1844, Nov. 21; b. Bern: founder of the institution for the improvement of education and agriculture at Hofwyl in the canton of Bern, Switzerland His father was of patrician rank, and in consequence, a member of the government. From him F. received a very careful education; but it was his mother, great-granddaughter of the famous Dutch admiral, Van Tromp, who inspired him with the desire of usefulness. In 1789, he went to the univ. at Tübingen, for the study of law, and subsequently travelled in Europe, taking up his quarters not in the hotels of the large towns, but in the cottages of peasantry, that he might know the real condition and manners of the agricultural laborers, as well as the kind of education received by them. When the revolution of 1798 broke out in Switzerland, F. took part in it; but the faithlessness and want of public spirit on the part of the Bernese government induced him to withdraw from political life. He then purchased the estate of Hofwyl, near Bern, and soon entered into an alliance with Pestalozzi, the educationist. Their different characters, however, rendered the union impracticable, and they found it necessary to separate. F. proceeded with redoubled zeal to increase the produce of his estate by new improvements, to influence the neighborhood by his example, and to make his experiments known to the world by his agricultural treatises. At the same time, he founded an asylum for forsaken children. He also opened a school of theoretical and practical agriculture, and connected with it an institution for the education of the children of the higher classes. The establishment at Hofwyl acquired very great reputation, and pupils hastened to it from all quarters. Many foreign princes visited it, and on their return to their own countries, founded similar institutions. In 1830, F. founded a school of art, and some years later, an infant school. The institutions at Hofwyl were continued for some years by his son Wilhelm, and then given up. Compare Hamm, *F.'s Leben und Wirken* (Bern 1845).

FELLOE, n. *fĕl'lō:* see FELLY 2.

FELLOW, n. *fĕl'lō* [OE. *felaw:* Icel. *félagi*, a partner in goods; *félag*, companionship, association—from *fé*, goods; *lag*, society, a law: comp. Gael. *balaoch*, a lad—said to be from *ba*, cows; *laoch*, a lad]: a person or thing joined or associated with another; a companion; one of a pair; one of the same kind; a name of commiseration, kindly interest, or contempt; in a learned society, one who holds a higher status than that of a member; a member of a college who is on the foundation and receives an income from its revenues: V. in *OE.*, to pair with; to match. FEL'LOWSHIP, n. companionship; society; the position and emoluments of a fellow; in *college or univ.*, see below: in *business*, see PARTNERSHIP. FELLOW-CREATURE, a human being; one of the same race. FELLOW-COMMONER, in *Univ. Camb.*, a student, usually married or wealthy, who, at extra charge, formerly dined at the 'commons' and associated with the fellows; known at Oxford as gentleman-commoner (see COMMON, etc.). FELLOW-COUNTRYMAN, a native of the same country. FELLOW-FEELING, sympathy, joint-interest.

FELLOWS, *fĕl'ōz*, Sir CHARLES: 1799–1860, b. Nottingham, England: antiquary. In the beginning of 1838, he commenced his travels in the East. His researches were chiefly in the w. peninsula of Asia Minor, and in the region of the ancient Xanthus, in the s. of that peninsula. In the valley of the Xanthus, he discovered, only nine m. from the coast, the ruins of the city of Xanthus, former cap. of Lycia. 14 or 15 m. higher up the river, he found the ruins of another city, which, from inscriptions, he found to be the ancient Tlos. F. returned to England, and published *A Journal written during an Excursion in Asia Minor, by Charles Fellows*, 1838 (Lond. 1839). In 1839 he again visited Lycia, and in another excursion discovered the ruins of 13 cities. Another journal, *An Account of Discoveries in Lycia, being a Journal kept during a Second Excursion in Asia Minor* (Lond. 1841), was the result of this journey. In 1841, an expedition left England to select works of art from the ancient cities discovered by F., who accompanied and directed the expedition. Another expedition sent out by the trustees of the British Museum brought home 20 cases of marbles and casts, 1844. These remains are in the British Museum, in the Lycian Saloon. In 1845, F.'s labors were rewarded by knighthood. The other works of F. are—*The Xanthian Marbles: their Acquisition and Transmission to England* (1843); *An Account of the Ionic Trophy Monument Excavated at Xanthus* (1848); a re-issue of his earlier Journals under the title of *Travels and Researches in Asia Minor, particularly in the Province of Lycia* (1852); and *Coins of Ancient Lycia before the Reign of Alexander; with an Essay on the Relative Dates of the Lycian Monuments in the British Museum* (1855).

FELLOWS, *fĕl'ōz,* JOHN: 1733–1808, Aug. 1; b. Pomfret, Conn.: soldier. He served in the French and Indian war; was elected a member of the provincial congress of Mass. 1775; organized and led a regt. of minute men to Boston directly after the fight at Lexington; was commissioned brig gen. in the continental army 1776, June 25; and was in command of a brigade in the battles of Long Island, White Plains, and Bemis's Heights. After the war he settled in Sheffield, Mass., and was sheriff of Berkshire co. several years.

FEL'LOWSHIP, IN A COLLEGE OR UNIVERSITY: position and emoluments of a Fellow. For the history of this institution, see UNIVERSITY. In the two great universities of England—Oxford and Cambridge—the fellowships were either constituted by the original founders of the colleges to which they belong, or they have been since endowed. In almost all cases, their holders must have taken at least the first degree of bachelor of arts, or student in the civil law. One of the greatest changes introduced by the commissioners under the University Act of 1854, was the throwing open of the fellowships to all members of the univ. of requisite standing, by removing the old restrictions by which many of them were confined to founder's kin, or to the inhabitants of certain dioceses, archdeaconries, or other districts. Fellowships used to vary greatly in value, some at Oxford being worth £700 or £800 in good years (varying with the revenues of the college lands), and some being less than £100, both at Oxford and at Cambridge. Many fellowships were tenable for life, but they were in general forfeited should the holder attain to certain preferments in the church or at the bar. In general, also, they were forfeited by marriage, unless a special vote of the college removed the disability in any given case. But of late, great changes have been made in withdrawing restrictions as to marriage, limiting the stipends, and reducing the tenure to a definite period of years. Thus at Cambridge, under the statutes of 1881, the restrictions as to celibacy and holy orders are wholly removed; the stipend is limited in most colleges to £250 per annum (exclusive of certain allowances); and the tenure is not to be longer than six years, except in the case of fellows who occupy a university or college office. So long as fellows perform university or college functions, they may hold their fellowships. The fellowships confer on their holders the privilege of occupying apartments in the college, and generally, in addition, certain perquisites as to meals or commons. With the single exception of Downing College, Cambridge, in which the graduates of both universities are eligible, the fellowships are confined to the graduates of the university to which they belong.

In the United States, according to the annual report of the U. S. commissioner of education for 1900-1, there was a total of 488 fellowships in 473 institutions reporting. The institutions having greatest number were Univ. of Chicago 80; Columbia Univ. 33; Cornell Univ. 24; Johns Hopkins Univ. 23; Harvard Univ. 38; Clark Univ. (Mass.) 20; Vanderbilt Univ. (Tenn.) 19; Yale 21; Univ. of Penn. 31. At the same time there were 8,132 *scholarships*, of which the greater part provide only for free tuition, though some pay a large part of a student's expenses. Johns Hopkins Univ. had both fellowships and scholarships; the former are bestowed annually upon 23 students, as an encouragement to apply all their time to the special studies in which they had shown proficiency; the latter are granted (1) according to the founder's will to studious candidates from Md., Va., and N. C., who are educated free of charge, (2) as honors to meritorious students, (3) to 10 bachelors of art of the univ. and 10 graduates of any institution who may engage in the prosecution of special work at the univ. All the scholarships carry free tuition, and, some have an additional stipend.—In some institutions the fellows are the members of the board of trustees who have charge of the business affairs.

FELLY: see under FELL 2.

FELLY, n. *fĕl'lĭ*, FELLIES, n. plu *fĕl'lĭz* [AS. *felgu;* Ger. *felge;* Dut. *velghe;* Dan. *fælge*, a felly]: one of the curved parts of the wooden rim of a cart or carriage wheel, usually covered with an outer iron rim. FELLIES, n. plu. the whole rim: also spelled FELLOE, n. *fĕl'lō.* FEL'LOES, n. plu. *-lōz.* FELLY-COUPLING, n. a box for inclosing the adjacent ends of fellies in the rim of a wheel. *Note.*—The FELLY is so named from the pieces of the rim being stuck or put together end to end: AS. *feolan*, to stick.

FELO DE SE, *fē'lō dĕ sē'* [mid. L. a felon upon himself]: in *English law*, a person who being of the age of discretion, and *compos mentis*, voluntarily kills himself, committing felony by suicide (see FELON). 'No man,' says Sir M. Hale (*Pl. of the Cr.* 411), 'hath the absolute interest of himself, but 1*st*, God Almighty has an interest and propriety in him, and therefore self-murder is a sin against God; 2*d*, The king hath an interest in him, and therefore the injunction in case of self-murder is *felonicè et voluntariè se interfecit et murderavit contra pacem domini regis.*' A man or woman is considered of full age in regard to capital offenses at the age of 14. A lunatic killing himself during a fit is not guilty of F.; but a merely melancholy and hypochondriacal temperament is not such a state of mind as will relieve a person from the consequences of this offense. Where two persons agree to die together, and in pursuance of this design one or both die, it is suicide, or felo de se, And in some cases, where one maliciously attempts to kill another, and unwittingly kills himself, this is said (Hawkins, P. C. c. 27, s. 4) to be felo de se. But as a general rule the act must be voluntary. Formerly, the law in England punished this offense by inflicting ignominy on the body of the offender, which was ordered to be buried by night at four cross-ways, and that a stake should be driven through the body. But this ignominious mode of burial is abolished, and a F. may be interred in cemeteries or churchyards with the usual funeral rites, if a clergyman consents to perform them. All the chattels, real and personal, of a F. are forfeited to the crown. See SUICIDE.

FELON, n. *fĕl'ŏn* [F. *félon,* cruel—from mid. L. *felōnem,* a felon: Bret. *fall,* bad, wicked: comp. Gael. *feall,* treachery, treason; *feallan,* a traitor—connected with *fell,* cruel]: one who has committed a crime punishable with forfeiture of goods and other penalty; a name for malignant whitlow: ADJ. pertaining to a felony; cruel; inhuman. FELONY, n. *fĕl'ŏ-nĭ,* a crime punishable with the forfeiture of goods and estates and other penalty; in *law,* every species of crime which occasions the forfeiture of land and goods; a crime in general. FELONIOUS, a. *fĕ-lō'nĭ-ŭs,* done with intention to commit crime; malignant. FELO'NIOUSLY, ad. *-lĭ.* FELONOUS, a. *fĕl'ŏ-nŭs,* in *OE.,* felonious; perfidious; traitorous.—*Felony* (a word whose origin is ultimately cognate with Lat. *fallere* and Eng. *fail*), prob. had for its original signification the act of a vassal who failed in his fidelity or allegiance to his superior, thus committing an offense by which he forfeited his fee or feud. From this it came to signify traitorous or rebellious, and was gradually generalized till it reached its popular meaning of a crime of so heinous a nature as to infer a capital punishment. The characteristic distinction of a felony, in the opinion of all legal writers, is, that it is a crime which occasions the forfeiture of the offender's goods. Treason itself, says Sir Edward Coke, was anciently comprised under the name of felony. . . . And not only all offenses now capital are in some degree or other felony, but . . . many other offenses not punishable with death, as suicide, manslaughter, and larceny, as they submit the committers of them to forfeitures.' A convicted felon forfeits and is disqualified for any government or public office.—SYN. of 'felon n.': convict; criminal; culprit; malefactor.

FELSPAR, n. *fĕl'spâr* [Ger. *feldspath,* rock-spar—from *feld,* a field; *spath,* spar]: an important rock-forming mineral, consisting chiefly of silicate of alumina, along with other silicates; a white, greenish, or flesh-colored mineral, generally hard and brittle, and sometimes glassy—one of the chief ingredients of granite. FELSPATH'IC, a. *-spăth'ĭk,* of the nature of felspar; containing felspar.—*Felspar* is extremely abundant in almost all parts of the world. It is a principal constituent of many rocks, as granite, gneiss, greenstone, trachyte, etc.; and clays seem very generally to have resulted in great part, from its decomposition. It occurs both massive and crystallized, in rhomboidal, pyramidal, and prismatic crystals, often having their edges and angles truncated, and thus very variously modified. There are many different kinds of F., which mineralogists have recently attempted to arrange in mineral species, distinguished by physical and chemical characters, and also by geognostic position, and by the groups of minerals with which they are associated. For these mineral species new names have been invented, *Orthoclase, Oligoclase, Albite, Labradorite*, etc. All the felspars are anhydrous silicates of alumina, and of an alkali or lime. Orthoclase, and the other more silicious felspars containing potash, abound chiefly in granite and the *plutonic* rocks; the less silicious, containing soda and lime, characterize the *volcanic* rocks—'as labradorite the basaltic group, glassy felspar the trachytic.' All the kinds of F. are so hard as not to be easily scratched with a knife, and are fused with difficulty. Some of them are soluble, some insoluble in acids. —The kind known as Common F.—referred to *Orthoclase* —is generally white or flesh-colored, has a glassy and somewhat pearly lustre, is translucent at least on the edges, and has an uneven or splintery fracture. Crystals four or five inches long are found. This variety, under the name of *Petunse* or *Petuntze*, is used by the Chinese in the manufacture of porcelain; together with some of the quartz which is associated with it in the rock. It is used, with other materials, as a flux; and alone to form an enamel or glassy covering, without which the porcelain would absorb moisture and grease, and would be unfit for any except mere ornamental purposes.—Adularia (q.v.) is a transparent and almost colorless variety of F., often cut as an ornamental stone, the finest varieties, of which one is known as Moonstone, being prized almost as gems. A variety, found among rolled stones in Ceylon, and remarkable for the reflection of a pearly light, has been sometimes confounded with *Cat's Eye*.—Avanturine F. is similar to the variety of quartz called *Avanturine* (q.v.) in the play of light which it exhibits, and which is said to be owing to minute crystals of specular or titanic iron. It is much esteemed as an ornamental stone. A variety with golden yellow specks, called Sunstone, is very rare and very beautiful: it sells at a high price.—Labradorite (q.v.) exhibits rich colors and a beautiful opalescence, on account of which it is much used for ornamental purposes.—A blue variety of F., found only in Styria, and a green variety, sometimes called *Amazon Stone*, are also esteemed as precious stones. All the finer varieties of F. are characterized by a soft beauty, which well compensates for the want of that brilliancy which belongs to the true gems.—*Kaolin*, or *Porcelain Clay*, is regarded as a decomposed felspar.—To F. also are referred, as chiefly composed of it, or apparently derived from it, Felstone, Trachyte (q.v.), Claystone, Clinkstone (q.v.), Pitchstone (q.v.), Obsidian (q.v.), and Pumice (q.v.).—Felstone, n. *-stōn*, or Felsite, n. *-sīt*, name introduced by Prof. Sedgwick to designate eruptive rocks composed, in whole or large extent, of felspar. When they consist of a compact and apparently amorphous felspar, they are known as Trachytes—a variety of this rock, which splits into small slabs, that ring with a metallic sound, is called Phonolite. Trachyte, with distinct crystals of felspar scattered through it, becomes felstone porphyry; when the rock is in a vitreous condition, and has a resinous lustre, it is Pitchstone. Even in the most compact felstones, minute crystals may be detected, and these sometimes of such size as to form varieties completely granular and crystalline.

FELT, *fĕlt:* pt. and pp. of the verb FEEL, which see.

FELT, n. *fĕlt* [Ger. *filz;* Dut. *vilt;* It. *felze*, felt: mid L *feltrum*, a heavy cloth felted with wool: comp. Gael. *falt*, hair, matted hair (see FELL 5)]: the hide with its fur; cloth or stuff made of hair, wool, or other substance, by rolling and pressure, and not by weaving: V. to make cloth of hair, wool, or fur, by causing the material to mat together by means of pressure, rolling, or hammering. FELT'ING, imp.: N. the act or process. FELT'ER, n. one who. FELT'ED, pp.: ADJ. worked into felt. FELTLING, n. *fĕltlĭng*, the substances employed in lining puddling furnaces which are used for the production of malleable iron.—*Felt*, of hair and wool, is a fabric formed without weaving, by taking advantage of the natural tendency of the fibres of hair and wool to interlace with and cling to each other. The hatters' tradition concerning the invention of felt illustrates the principle of this manufacture. In most Rom. Cath. countries, the hatters celebrate as a festival Nov. 23, St. Clement's Day; and it is stated that St. Clement, when on a pilgrimage, put carded wool between his feet and the soles of his sandals, and found on his journey's end that the wool was converted into cloth. Although this tradition is very questionable, as the manufacture of felt is of far more ancient origin, there can be no doubt that if carded wool were thus continually trodden, and at the same time moistened, it would become felt, and all the manufacturer's processes of felting are but modifications of such treatment. This matting or felting of the fibres of hair and wool results from their structure, for, when examined by the microscope, the hair of all animals is found to be more or less jagged or notched on its surface; in some animals it is distinctly barbed; and this structure is so directed that the teeth or barbs all point towards the tip of the hair: see HAIR. If a piece of human hair (in which this structure is less marked than in most animals) be held between the finger and thumb, and rubbed in the direction of its length, it will invariably move between the fingers in the direction of its root; for the skin, while moving toward the tip of the hair, slides freely upon it, but moving in the other direction, against the inclination of the barbs, it brings the hair with it. It will be easily understood that when a number of hairs are pressed together, those which lie in opposite directions to each other and in contact will interlock at these barbs or teeth, and thus resist any effort to tear them asunder. When once this close contact and interlocking is established between any two or more hairs, they remain attached, but the others that are differently arranged, or not in contact, will still be free to move upon each other; and therefore, if subjected to continual blows, pushing, and pressure, like the treading of the feet in walking, the unattached hairs will be continually shifting until they reach others in suitable positions for clinging together either by crossing obliquely or by lying in the same line, and overlapping at their ends or any other portion. When the hair has a natural tendency to curl, the felting is still more readily brought about by the additional interlacing. This is the case with wool to such an extent, that when free from grease it cannot be retained in the straight carded condition required for spinning and weaving. When it is required to be felted, the natural grease has to be removed. This tendency to felt is shown in the hard lumps formed in wool-mattresses long used, The beaver-hat maker produces his felt by taking a few ounces of the mixed fur, distributing it in an even layer by twanging a bowstring against the heap, and then condensing this into a felt by a sort of kneading process with his hands: see Hat.—The felt now extensively used for carpeting and other purposes is made by machinery, chiefly from the waste wool from the weaving-mills. Many patents have been taken out for the various details of felting-machinery, but the main principle is the same in all. The wool is carded more or less perfectly, steamed or moistened with hot water, and passed between beaters which act like the pilgrim's feet. When used as drugget for covering carpets, or as a substitute for carpet, the felt is printed by means of blocks with various patterns, or simply dyed. Felt is used also for padding coats and other garments, sometimes for cloaks and capes; for table covers, some of which are beautifully embossed and printed; for carriage-linings, upholstery work, polishing cloths, pianoforte hammers, and various other purposes where a coarse or thick cloth is required. A simple kind of saddle, cut out of very thick felt, is common in S. America.

The 'felted sheathing' used as a non-conducting covering for retaining the heat in steam-boilers, is a substance intermediate between felt and paper, being composed of the commonest woolen refuse from paper-mills, etc., made into a semi-pulp, and beaten to produce a partial felting. This when dried hardens, and though having little tenaci and unfit for the wear of friction, has a compactness, which adapts it to its purposes.—*Asphalted Roofing-felt* is a very coarse felt saturated with pitch, asphalt, or coal-tar—usually the latter for cheapness; it is sold at a very low price and used for covering sheds and other buildings. A more expensive kind, free from coal tar, called *Inodorous Felt*, is used as a lining for damp walls on which paper is to be hung. Asphalted felt is used also as a flooring for granaries and similar buildings, and has been recommended for public schools, to prevent the noise from the shuffling of the children's feet.

FELT GRAIN, in *wood-work*, the grain of wood whose direction is from the pith to the bark; the direction of the medullary rays in oak and some other timber.

FELTON, *fĕl'ton,* CORNELIUS CONWAY, LL.D.: president of Harvard College, and Greek scholar: 1807, Nov. 6—1862, Feb. 26; b. West Newbury, Mass.: author. He graduated at Harvard Univ. 1827, and became Latin tutor there 1829, Greek 1830, Eliot prof. of Greek 1832, and pres. 1860. He was a member of the American Acad. of Arts and Sciences, and the Mass. board of education, and regent of the Smithsonian Institution. Though he spent but a single year abroad (1853–4), he was an enthusiastic student of art and an accomplished Hellenist from early life. He was author of a number of Greek text-books, published *Homer, with English Notes and Flaxman's Illustrations* (1833); *Menzel's German Literature,* 3 vols. (1840); the *Clouds* of Aristophanes (1841); *Classical Studies,* in connection with Sears and Edwards (1843); *Poets and Poetry of Europe,* in connection with Longfellow (1845); translated Guyot's *Earth and Man,* and edited the *Panegyricus* of Isocrates and *Agamemnon* of Æschylus (1849); edited the *Birds* of Aristophanes (1852); revised and continued to date Smith's *History of Greece* (1855); published *Selections from Modern Greek Writers* (1856); and left for posthumous publication *Familiar Letters from Europe* (1864); and *Greece: Ancient and Modern,* 2 vols. (1867).

FELTRÉ, *fĕl'trā:* town of n. Italy, province of Belluno, near the right bank of the Piave, 44 m. n.n.w. of Venice. It suffered severely from the attacks of the Goths in the 5th c. The chief buildings are the cathedral, the college, ecclesiastical seminary and gymnasium. F. has some trade in corn, wine, and oil. Pop. 6,500.

FELTRE, *fĕl'trā,* MARTO DA.: abt. 1474-1519: real name PIETRO LUZZO; b. Feltre, Italy: painter. Little is positively known about him, and few of his works remain. It is believed that he received his art education in Venice and spent the greater part of his life in Rome. He made prolonged studies in catacombs, grottoes, and subterranean remains, formed a style of fanciful arabesque painting which gained the name of *grottesche,* whence comes *grotesque;* and is believed to have received his sobriquet 'the dead man of Feltre' because of his melancholy temperament and singular line of study. His works were received with much favor Rome. He painted a number of fine grotesques in the Palazzo Pubblico, Florence, and, in conjunction with Giorgione, in the Fondaco dei Tedeschi, Venice; and, during a visit to his birth-place, executed some charming frescoes, still partly extant, in the loggia beside San Stefano. The church at Villabruna contains an altar-piece by him, representing the Virgin seated on a cloud, holding the child, who gives the benediction, with SS. George and Victor below. The Berlin Museum also has one of his paintings, an allegorical subject of peace and war. Other reputed works are of doubtful origin. F. is charged with having broken the heart of Giorgione, his master, by eloping with his wife, and is said to have been killed in the battle at Zara, while an officer in the service of the Venetian republic.

FELUCCA, n. *fē-lŭk'kă* [It. *feluca;* Sp. *falúca;* Ar. *fulk,* an open boat, a ship]: small sailing vessel common in the Mediterranean; propelled by 10 to 16 oars, and by lateen sails. It has frequently a rudder at each end, to be applied as occasion demands. In war, feluccas armed with a heavy gun or two, and sent out as gun-boats against ships that are becalmed, have been found very troublesome; from their speed in smooth water and the difficulty of hitting them.

FEMALE, n. *fē'māl* [F. *femelle*—from L. *femella,* a female—from *femĭnă,* a woman]: one of that sex which conceives and brings forth young: ADJ. not male; pertaining to the sex that brings forth young; delicate. FEMALE-SCREW, a spiral-threaded cavity into which another screw turns; the nut. FEMININE, a. *fĕm'ĭ-nĭn* [F. *féminin*—from L. *femĭnīnus,* feminine]: belonging to the female sex; womanish; tender; delicate: N. in *gram.*, a noun or name of the female gender; in *OE.*, woman. FEMINITY, n. *fĕm-ĭn'ĭ-tĭ,* the qualities of character pertaining to women. FEMME-COUVERTE, *făm-kŭv'ért,* or FEME COVERTE (see below) [F. *femme,* a woman; *couvert,* covered]: in *law,* a married woman. FEMME-SOLE', *-sōl'* [OF. *sole;* L. *solus,* alone]: in *law,* an unmarried woman. FEMALE RHYMES, double rhymes, or having added syllables—so named because in French they end in *e* weak or feminine. FEMALIZE, v. *fē'măl-īz,* to invest with the qualities or character of a female; to emasculate. FE'MALIZING, imp. FE'MALIZED, pp. *-īzd.*

FEME COVERTE, *fĕm kŭv'ért,* or FEMME COUVERTE (*fœmino viro co-operta*): in *law,* a married woman. See MARRIAGE: HUSBAND AND WIFE: etc.

FEMERELL, n. *fĕm'ér-ĕl* [F. *fumerelle*—from *fumer,* to smoke; L. *fumus,* smoke]: in *arch.*, a louvre, lantern, or covering placed on the roof of a kitchen, hall, etc., for the purpose of ventilation or the escape of smoke.

FEMERN, *fā'mérn:* island in the Prussian province of Schleswig-Holstein, taken from Denmark 1864. It is separated from Holstein by a strait called the Femern Sound, has 70 sq. m.; is flat, fruitful, and destitute of wood. Agriculture, fisheries, and stocking-weaving for exportation, are the principal employments of the inhabitants. The chief town is Burg, pop. (1881) 2,962. Pop. of the island, abt. 10,000.

FEMGERICHTE or VEHMGERICHTE, *fām'gĕh-rĭch-tĕh* [from the old German *fem*, punishment, and *gericht*, court of justice]: spoken of as the Holy Feme (or Fehme), and as the Westphalian or Secret Tribunals: among the most remarkable phenomena of the middle ages, and supplied the place of the regular administration of justice, then in a deplorable condition. The origin of these courts has been ascribed to Charlemagne, who, it was pretended, had instituted them to prevent the relapse into Paganism of the Saxons who had been forcibly converted to Christianity. It is more probable, however, that they were a relic of the ancient German free courts of justice, the preservation of which may have been favored in Westphalia by special circumstances.

When Henry the Lion was put under the ban of the empire, and deprived of his possessions 1179, Westphalia, which then comprised nearly the whole district between the Rhine and the Weser, was granted to the Abp. of Cologne; and from this time the secret tribunals gained in importance. In the general confusion in Germany, when all laws, civil and ecclesiastical, had lost their authority, and the fabric of society seemed on the point of toppling into ruins, the F. were organized for the purpose of arresting the incipient anarchy that threatened to bring chaos back again, and of inspiring with salutary terror through their mysterious powers and solemn judgments, all rapacious and lawless persons (but especially the feudal barons), who were committing crimes without legal check. Thus, in the causes of their formation, and in general design, the F. resemble the Hanseatic towns. They soon acquired tremendous influence, the emperors themselves having recourse to their assistance against powerful and rebellious nobles. In the 14th and 15th c. they attained the summit of their dread authority, when they began to extend themselves over the whole of Germany. Beneficial as in many instances they proved to be, they could not fail, in the long-run, to degenerate, and to be frequently employed as a cloak to self-interest and malice. Many voices, therefore, were raised against them, and in 1461 various princes and cities of Germany, as well as the Swiss confederates, formed unions for affording justice to every individual, and preventing any from seeking it from the secret tribunals. Particular classes likewise obtained imperial letters of protection against the pretensions of these tribunals. The emperors themselves, however, could go no further than to make some unavailing attempts to introduce improvements into the constitution of the F., as the latter were bold enough to oppose the imperial authority, and even summoned the emperor Friedrich III. to appear before them. Their influence came to an end only when the public peace (*Landfriede*) was established in Germany, and an amended form of trial and penal judicature was introduced. The last real F. was held at Celle, in Hanover, 1568. A remnant of the institution, however, existed in Westphalia until 1811, at which time it was performing the function of a society for the suppression of vice, when it was abolished by an order of Jerome Bonaparte. Beyond the limits of Westphalia, notwithstanding all their endeavors, the F. never succeeded in fully establishing their authority; and even in the *Red Land*, as Westphalia was called (probably from the color of the soil), they were restricted by the imperial privileges on which they founded their authority.

The members of the F. were called *Wissende*, 'knowing ones,' or the *initiated*. It was necessary that they should be born in wedlock, be of the Christian religion, lead a blameless life, and bind themselves by a tremendous oath 'to support the holy Feme, and to conceal it from wife and child, father and mother, sister and brother, fire and wind, from all that the sun shines on and the rain wets, and from all that is between heaven and earth.' Originally, none but an inhabitant of the 'Red Land,' possessed of real property, could be admitted a member of the Wissende; later this rule was relaxed. From the general body were elected officers called *Freischöffen* (free justices), who were assessors of the court, and executors of its sentences. The presiding judge was called the *Freigraf* (free count). The general superintendence and presidency of the secret tribunals belonged to the lord of the land—i. e., in Westphalia, to the Abp. of Cologne. The highest office, however, as supreme president, was nominally held by the emperor, who was usually elected into the number of the Wissende on the occasion of his coronation at Aix-la-Chapelle. The court of a Freigraf was called *Freiding* (a free court of justice), and the place where he held court a *Freistuhl* (free bench or court). One of the most celebrated free courts had its seat at Dortmund. The sittings of the tribunal were either open or secret. The former were held by day in the open air, and decided in civil disputes: the secret tribunals took cognizance of those who had been unable to prove their innocence in the open courts, as well as of those who were accused of heresy, sorcery, rape, theft, robbery, or murder. The accusation was made by one of the Freischöffen, who declared, upon oath, that the accused had committed the crime. The citation was secretly affixed, with symbolical signs, to the door of the accused, who was to meet the Wissende at a certain hour and place, and be conducted by them before the tribunal. The accused could now clear himself by an oath, but the accuser and witnesses could oppose this with another. If the accused could now bring forward six witnesses to swear in his favor, the accuser could strengthen his oath with 14 witnesses; and it was not till after 21 witnesses had made their affidavit in his favor that sentence of acquittal necessarily followed. The persons convicted, as well as those who refused to obey the summons, were given over to the Freischöffen. The first Freischöffe who met him was bound to hang him on a tree, or, if he made any resistance, to put him otherwise to death. A knife was left by the corpse, to show that it was not a murder, but a punishment inflicted by one of the Freischöffen. Compare Wigand, *Das Fehmgericht Westfalen's* (Hamm. 1825), and Usener, *Die Frei- und heimlichen Gerichte Westfalen's* (Frankfort 1832); Geisberg, *Die Fehme* (1858).

FEMORAL, a. *fĕm'ŏ-răl* [mid. L. *femorālis*—from L. *fĕmur*, the thigh, *femŏrĭs*, of the thigh: It. *femorale;* F. *fémoral*, pertaining to the thigh]: pertaining to the thigh. FEMUR, n. *fē'mŭr*, a thigh-bone; the largest and longest bone of the body (see SKELETON). FEMORAL ARTERY, an artery lying in front of the thigh, being a continuation of the external iliac.

FEN, n. *fĕn* [Icel. *fen*, a morass: Dut. *veen;* Goth. *fani*, mud: comp. Gael. *feannag*, a ridge of ground]: low, marshy, or boggy ground, covered wholly or partially with water. FEN'NY, a. *-nĭ*, pertaining to a fen. FENS: see BEDFORD LEVEL. FEN-FIRE, n. the Will-o'-the-wisp, an ignus fatuus.

FENCE, n. *fĕns* [F. *défendre*, to forbid; *défense*, prohibition: an abbreviation of *defence* (see DEFEND)]: a boundary composed of a hedge, or line of posts, or stakes driven into the ground; an inclosure; guard; security; the art of fencing: V. to inclose with a hedge, or a wall of posts; to protect or guard; to defend by giving and avoiding blows, as with a foil or sword. FEN'CING, imp.: N. fences, or the materials used to form them; the act or art of skilfully using a foil or sword in attack or defense. FENCED, pp. *fĕnst*, inclosed by a wall of posts; fortified. FEN'CER, n. *-sėr*, one who. FENCIBLE, a. *fĕn'sĭ-bl*, capable of defense. FENCE'LESS, a. uninclosed. FEN'CIBLES, n. plu. *-sĭ-blz*, soldiers for home service only, or regiments raised only at and for a special crisis; sometimes, however, the local as distinguished from the general militia; also, some volunteer corps. The only British regiment remaining with this title is the 'Royal Malta Fencible Artillery.' FENCE-MONTH, n. the fawning month during which deer-hunting is forbidden. There are also fence-months for various kinds of fishes, as trout, salmon, etc. A FENCE, among *burglars*, the person who buys stolen property. RING-FENCE, a fence or wall entirely surrounding an estate. FENCING THE TABLES, in the *Scotch Presb. Churches*, address by the officiating clergyman to those about to partake of the elements of the Eucharist or Lord's Supper, solemnly pointing out to them the conditions for communicating worthily, and the sins which disqualify and exclude.

FENCE, in Agriculture: guard or barrier along a boundary-line, inclosing animals on pasture-grounds, and protecting land from straying animals. They are of great variety of materials, and of very different structure. Where wood or stones are scarce, as in many countries long settled, hedges, formed of various kinds of plants, are common. These, well kept and managed, give a clothed and picturesque appearance to the landscape. The hawthorn is the well-known hedge-plant of Britain: see HEDGES. When stones are used as fences, they are built as walls.

In new countries, where trees abound, fences are mostly of wood. The snake-fence, named from its zigzag form, is made of rails, 12–16 ft. long. The end of the lower rail is laid upon a block or stone and the others are piled above. The deflection from a right line varies from five to eight ft. Stakes are usually placed at the corners, under the top rail, to increase the height and to strengthen the fence. Post and rail fences require less timber and encumber only about one-third as much land as rail fences, but involve more work to build and are not so durable. In some parts of the country post and board fences are more popular than either of the above. Wire fences are the cheapest and most efficient and are now the most extensively built. There are about 50 different patents. The most common form is made of two twisted steel wires with barbs inserted at intervals of six or eight inches. Posts are set 16–35 ft. apart, and from two to five strands of wire are fastened to them by staples made for the purpose.

Law regarding Fences.—By common law each owner of live stock was obliged, either by fencing or otherwise, to keep his animals on his own land. But the statute laws regarding fences vary greatly in different states. In most, if not all, of the states officers called 'fence-viewers' are chosen by the various towns, to whom disputes relating to fences may be referred. In the newly settled portions of the country cattle are allowed to run at large, and crops must be protected from them by suitable fences or no claim for damages can be sustained. The height of a legal F. is four ft. in some states and five ft. in others, being determined by the legislature. In sections where the law does not allow cattle to roam at will the owner of a cultivated field is not obliged to fence it, and no road side fences are required. If cattle damage the crops or the land, even if there is no F., the owner of the stock must pay therefor. This, however, does not fully apply where cattle are being driven along the highway. In such cases if the owner of the cattle has a proper number of drivers, is reasonably careful, and as quickly as possible drives the animals from the field, on which they are trespassing, he is not liable for damage done while they were temporarily beyond his control. But if cattle accidentally escape from a pasture, as when a gate is left open (even though it be opened by a trespasser), their owner is responsible for any damage that they may do. Animals trespassing in fields legally fenced, or in open fields in sections where fencing is not required, may be taken as estrays by the proprietor of the land, but if their owner is known he must be promptly notified. In some localities the cattle can be held until the damages, which should be appraised by disinterested parties, and the necessary costs, are paid; but in all cases the animals must be properly cared for by the man who has them in charge. Partition fences are to be built and maintained by the parties owning the fields which they separate, each paying one-half the cost of construction and repairs. These fences should always be on the boundary line. If either party neglects to keep his portion of the fence in repair the other should notify him that repairs are needed. If the notice is disregarded he can make the necessary repairs and collect from the negligent party a fair remuneration for the same. If one of the owners wishes to allow his land to remain idle he cannot be required to build or repair any portion of a partition fence. In this case the party desiring to crop his land must build and maintain the entire fence until the other party brings his land into cultivation.—See TRESPASS: also FIXTURES.

FEN'CING: art of defending one's own body or assailing another person's in fair fight by the aid of a side-weapon—i.e., by a sword, rapier, or bayonet. Technically, F. is usually limited to the rapier, and works on the art treat only of attack and defense with the foil in pastime, and the rapier in actual personal combat. In a general consideration of F., however, the elements of single combat with foil, sword, and bayonet have a place. The objection formerly existed that instruction in F. encouraged a propensity to duelling; but as that absurdest of absurd customs is passing away with the advance of civilization, the objection is not now important. F. may therefore be safely learned and taught as an elegant and manly accomplishment, developing gracefulness and activity, while it imparts suppleness to the limbs, strength to the muscles, and quickness to the eye. This regards fencing with the foils (the rapier has disappeared with the duels which employed it); but instruction in fencing with the sword and bayonet, while conferring the same advantages, has in addition the recommendation of helping to fit the student for taking an active part in any general national defense. The Foil (q.v.) is a circular or polygonal bar of pliable and very highly tempered steel, mounted as any other sword, and blunted at the point by a 'button,' to prevent danger in its use. From its nature, the foil can be employed only in thrusting, and, being edgeless, it can be handled without liability to cutting wounds. The length of the blade should be proportioned to the height of the person using it—31 inches being the medium lenght for men, and 38 inches from hilt to point the maximum allowable. As a protection against accidental thrusts, the face is generally guarded by a wire-mask. The two portions of the blade are known as the 'forte' and the 'feeble;' the first extending from the hilt to the centre, and the other from the centre to the point.

In drawing, advance the right foot slightly to the front, take the scabbard with the left hand, raise the right elbow as high as the shoulder, seize the hilt with right hand, nails turned inward, and having drawn the foil, pass it with vivacity over the head in a semicircle, and bring it down to the guard (of which presently) with its point toward the adversary; not higher than his face, nor lower than his lowest rib. Simultaneously with the weapon being brought into position, the left hand with fingers extended should be raised to a level with the head, as a counterpoise in the various motions to ensue. In establishing the position of guard, the right foot must be advanced 24 inches before the left, the heels in a straight line, and each knee slightly bent, to impart elasticity to the movements, but not too much, lest the firmness of the position be diminished.

In F., there are three openings or entrances—the *inside*, comprising the whole breast from shoulder to shoulder; *outside*, attackable by all the thrusts made above the wrist on the outside of the sword; and the *low parts*, embracing from the armpits to the hips. For reaching and guarding these entrances, there are five positions of the wrist—prime, seconde, tierce, carte (quarte), and quinte. The most important, and those to commence with, are carte and tierce, from which are derived the subordinate positions of carte over the arm, low carte, and flanconnade or octave, To *engage* is to cross swords with your adversary, pressing against his with sufficient force to prevent any maneuver taking you unawares. To disengage is to slip the point of your sword briskly under his blade, and to raise it again on the other side, pressing in a direction opposite to that of the previous case. The *guard* in each position is a passive obstruction to the opposing thrust; the *parade* is an active obstruction, in which the guard is first assumed, and the blade then pressed outward or inward by a turn of the wrist against the adversary's sword, so that when thrust at your body it shall be diverted from its aim, and held off. The parade may therefore be regarded as a mere extension of the guard. If the parade were called the 'parry,' it would convey its meaning more readily to English ears. Another, and perhaps more appropriate name for thrust is the 'lunge' or 'longe,' as the thrust is almost always accompanied by a lunge forward of the right foot, to give at once greater force and longer command to the blow.

The following are directions for the principal guards and thrusts.

Carte, Guard.—Turn wrist with nails upward; hand on a line with lower part of breast; arm somewhat bent, and elbow inclined a little to the outside; point of foil elevated at an angle of about 15°, and directed at upper part of adversary's breast.

Thrust.—Being at the guard in carte, straighten the arm, raise the wrist above the head, drop the foil's point to a line with the adversary's breast, throw first the wrist, and then the whole body, forward by a lunge with the right foot of two ft. from the 'guard,' the left foot remaining firm. The left hand should be dropped during the lunge to a level with the thigh, and to a position distant about 12 inches from the body; it will then afford a good counterpoise to the sword-arm. During the whole action, the body must be perfectly upright. When performed briskly, it appears that the point and foot are advanced simultaneously, but in fact the point has, or should have, priority, in order that the instantly following lunge may drive it home. Most of these observations concerning thrust in *carte* apply equally to all other thrusts.

Carte over the arm is a variety of this thrust. The sword is driven outside the adversary's blade, from the carte position, but in the tierce line.

Low Carte.—Engage adversary's blade in carte, then drop point under his wrist, in a line to his elbow, and thrust at his flank, the body being considerably bent.

Flanconnade or Octave.—Engage adversary's blade in carte, and bind it with yours, then carry your point behind his wrist and under his elbow: without quitting his blade, plunge your point to his flank.

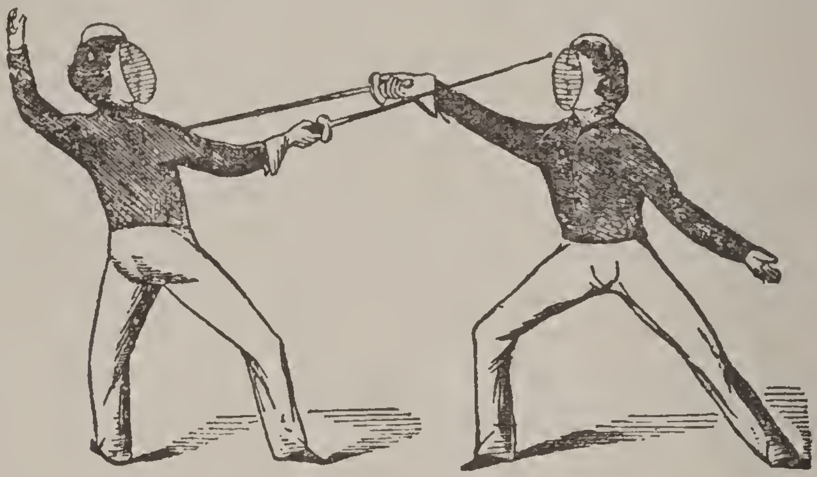


Fig. 1.—Carte.

Tierce, Guard.—As in carte, the nails and wrist being somewhat more downward, and the arm stretched a little outward, to cover the outside.

Parade.—Move arm, from the guard, obliquely downward to the right about six inches, and oppose the inside of the adversary's blade.

Thrust.—From the guard, turn wrist with nails downward, the same height as in carte, the inside of the arm in a line with the right temple; then thrust and lunge as in carte.

Seconde, Parade.—Nails and wrist downward, hand opposed outward, and blade, pointing low, should form an angle of about 45° with the ground.

Thrust.—The same as tierce, but delivered under the adversary's wrist and elbow, to a point between his right armpit and right breast: the body to be more bent than in carte or tierce.

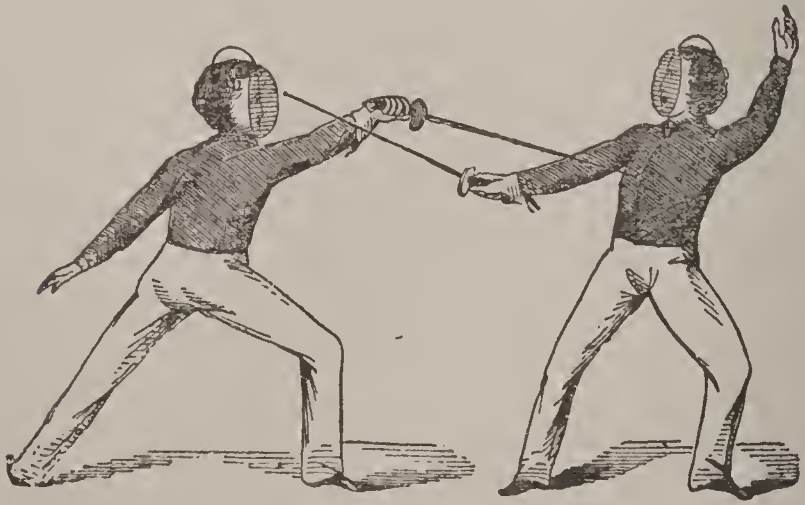


Fig 2.—Tierce.

Prime, Parade.—In using prime to parry the thrust in seconde, pass your point over the adversary's blade, lower it to the waist, keeping your wrist as high as your mouth, nails downward, elbow bent, and body held back as far as possible. The left foot should also be drawn backward a few inches, to remove the body further from the hostile point.

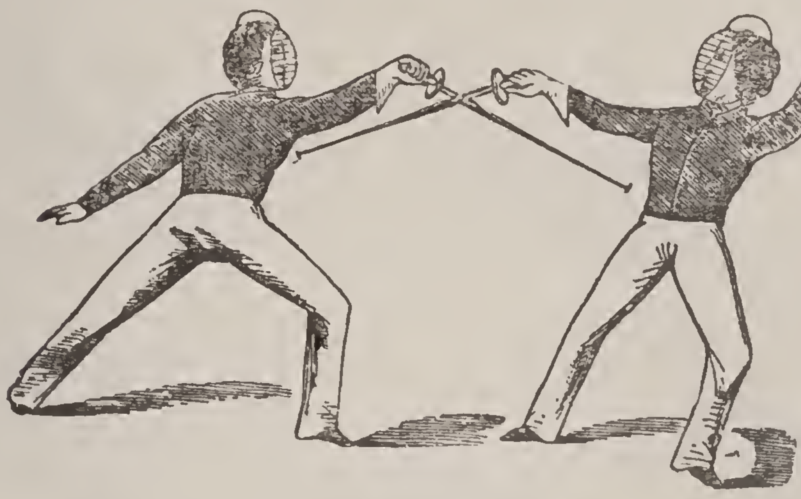


Fig. 3.—Seconde.

Thrust.—An extension movement from the parade.

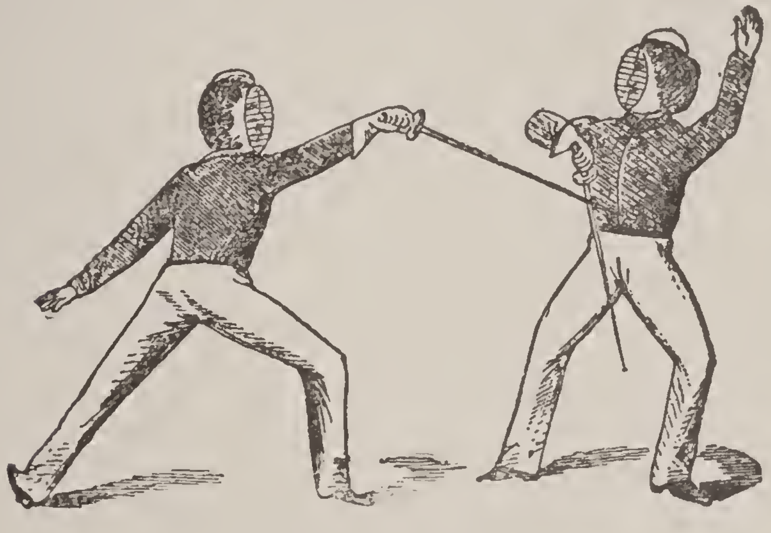


Fig. 4.—Prime.

Quinte, Parade.—Wrist in high carte, sword-point low, and oppose adversary from the forte of the outside edge of your blade.

Thrust.—Make a feint on the half-circle parade, with the wrist in carte; disengage your point over the adversary's blade, and thrust directly at his flank.

Half-circle, Parade.—One of the principal defensive parades: straighten arm, keep wrist in line with shoulder, nails up: by quick motion of wrist sweep point from right to left in a circle covering your body from head to knee, until the adversary's blade is found and opposition established.

The parades parry thrusts as follows:

Carte, with wrist low, parries low carte and seconde;

with wrist raised, all the thrusts over the point on the inside of the sword and the flanconnade.

Tierce parries, high carte; with raised wrist, parries tierce.

Seconde parries all lower thrusts, both inside and outside.

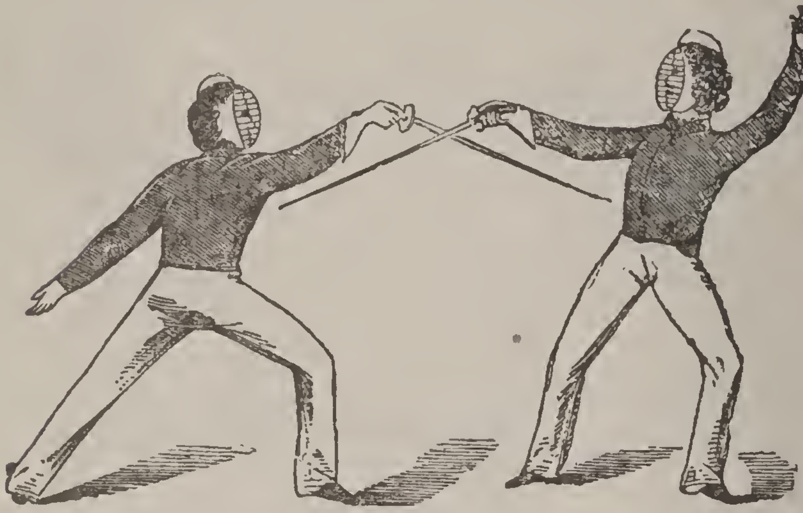


Fig. 5.—Quinte.

Half-circle parries carte, high carte, tierce, and seconde.

Prime parries carte, low carte, and seconde.

Quinte parries seconde and flanconnade.

In all parades or parries, care must be taken that in covering the side attacked, the parade is not so wide as to expose the other side to the enemy. A steady countenance, showing no disquietude at any attempt he may make, is, above all, necessary in parades.

Every parade has its return, which should be made with vivacity and decision. A thrust can be returned when the adversary thrusts, or when, baffled in his attack, he is recovering to his guard. In the first case, no lunge is necessary, the return being made from the wrist: this return requires great skill and quickness, since the adversary should receive the thrust before, by finishing his own, he has touched your body.

Ordinary Returns.—After carte parry, return in carte; after tierce, return in tierce; after parrying high carte, return seconde; after parrying seconde, return in quinte; after parade in prime, return seconde or low carte.

Feints, of which there are many varieties, consist in threatening an attack on one side of the sword, and then executing it on the other. The best parade against a feint is that of the half-circle, which will be sure to find the adversary's point.

Advance and Retreat are motions of attack or withdrawal, performed by advancing the right, or withdrawing the left foot suddenly about 18 inches, and instantly following it with the other foot. As the adversary advances, you must retreat, unless prepared to receive him at the sword-point.

Salute.—The salute is a courteous opening of the fencing, and consists in gracefully taking off the hat, while, with the foils, your adversary and yourself measure your respective distances.

Appels or beats with the right foot, *beats* on the adversary's blade, and *glissades* or glidings of one sword along the other, are motions intended to confuse the enemy, and give openings for thrusts.

Voltes, demi-voltes, and *disarming,* were maneuvers formerly taught with care, but now quite discarded in the academies of England and France, as useless and undesirable.

In Spain and Italy, considerable differences of practice from that in France and England prevail. The left hand is used as an auxiliary in parrying, and in Italy is aided by a dagger, or sometimes a cloak. The Spaniard, though trusting to his sword and left hand only, has his blade five feet long, with sharp edges; his guard is nearly straight, and one of his favorite attacks is by a *cut* (not thrust) at the head.

In actual practice, there are endless variations of the different modes of attack and defense, which will be severally adopted according to the skill and option of the fencer. There is no finer indoor exercise than F., as the muscles in every limb are developed and strengthened by it. The great requirements for success are a steady eye and hand, a quick purpose as quickly executed, and, perhaps above all, perfect equanimity of temper.

The Sword Exercise differs from fencing with the foil in that the weapon employed has one cutting edge, as well as a point, and is therefore intended to cut and thrust. The sword is the arm, often the only arm, of officers in the army and navy, and of many non-commissioned officers. A certain degree of proficiency in its use is therefore always serviceable. In practice, the usual substitute is a stout, straight stick, called a 'single stick,' having a basket-handle to protect the knuckles.

The position of the combatant is the same as that assumed in fencing with the foil; the lunge is similar, as are also the 'advance' and 'retreat,' and other minor points. According to the instructions of drillmasters, there are seven cuts, with seven corresponding guards, and three thrusts. The theoretical directions of all these are shown on the

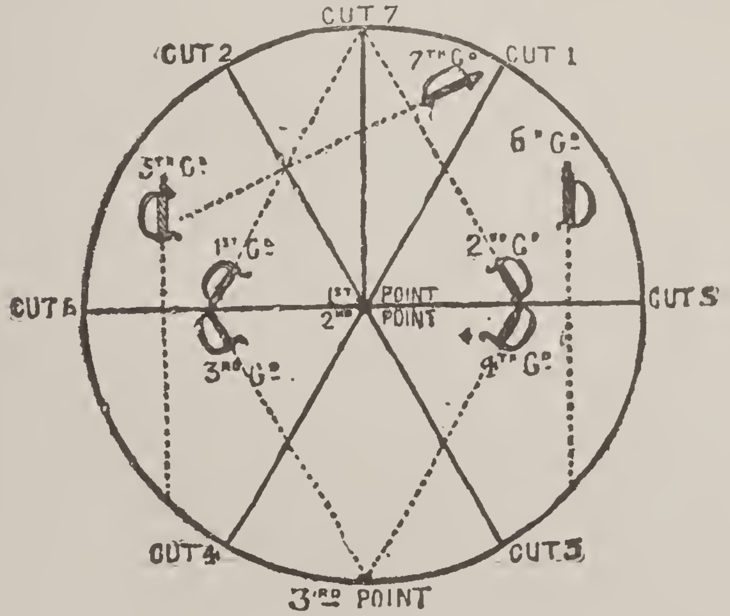


Fig. 6.

accompanying diagram, which represents a target placed opposite a pupil, so that he may see the motions he is expected to perform displayed before him. The centre of the target is supposed to be in a line with the centre of his breast.

The cuts proceed from the circumference towards the centre along the *thick* lines. Nos. 1, 3, and 5 are inside cuts, and attack the left cheek, left side, and inside of the right leg respectively; 2, 4, and 6 are outside cuts, attacking the enemy's right cheek, right side, and right leg on the outside. No. 7 is a vertical cut, aimed at the head.

The dotted lines show the position of the sword in the several guards by which the cuts are opposed. The sword-handles illustrate the situation of the right hand with reference to the centre of the body.

The points or thrusts are shown by the black circles. That toward No. 1 should be directed with the wrist and edge of the sword upward to the right; toward 2, with the edge upward to the left; and, in the 3d point, with the wrist rising to the centre, and the edge upward to the right.

The parry' is an additional defensive movement, and consists in bringing the wrist nearly to the right shoulder; whence, as centre, a circular sweep of the sword is made from left to right.

A considerable latitude is allowable in regard to the cuts, as to the part of the adversary's body at which they are directed, provided the general inclination of the blow be observed; similarly, the cut may at times be parried by a guard other than that intended specially for it, according to the discretion of the fencer.

In engaging, or joining swords, with the enemy, press the blades but lightly together, so that the hand and wrist may be readily susceptible of any motion. In making the guards, care must always be taken to receive, if possible, the feeble of the enemy's blade on the forte of your own, so as to offer the greater opposition. It should also be borne in mind that, in all cuts at the leg, when at proper distance, the shifting of your own leg, and delivering a cut at the same moment, becomes the most effectual and advantageous defense, particularly if you happen to be taller than your adversary, as you will then probably be out of his reach, while he is within yours.

In contending with bayonet or pike, the most effectual guard is the 5th, which, if well timed, enables the swordsman to seize the musket or pike with his left hand, and then make the 6th cut at his opponent's neck. In an encounter with the rapier, the best cuts are Nos. 3 and 4, as they attack the enemy's arm, which must be advanced within reach before he can touch your body, and also constitute a defense against his thrust. If the enemy—no matter how armed—be on horseback, the dismounted swordsman (provided he have proper nerve and agility) has decidedly the advantage. Endeavor to place yourself on his left, where he has less power of defending himself or his horse, and cannot reach to so great a distance as on his right: an attack on the horse will probably render it ungovernable, and it becomes easy then to avoid the rider's blows, while he himself may be attacked with impunity in almost any direction.

Bayonet Exercise.—A proper command of the bayonet is indispensable to the soldier in any close contest. In close quarter engagements, there is no weapon more formidable. from its length and weigth, the thrust of the bayonet gives a terrible wound, and its force is such that there is great difficulty in parrying the attack. Like other small-arms, it is most serviceable when handled on scientific principles; and the art of using it to advantage is so simple as to be easily acquired, while the exercise, from the weight of the rifle, admirably aids in developing the muscles of all parts of the body.

Of course, the bayonet is always fixed at the end of the musket, when it becomes virtually a pike. The position of the feet in the bayonet exercise remains always the same relatively, and absolutely until advance or retreat be effected. The right foot is thrown back 24 inches, and the weight of the body thrown upon it. The heels are kept in a line with each other, both knees bent and well apart; the right knee directly over the foot, the left easy and flexible, pointing to the front. In this position of the body, all the defensive motions of the bayonet are made. In 'guard,' the bayonet is brought nearly to a horizontal direction, level with the waist, and pointing toward the breast of an advancing enemy. Similarly, to 'guard,' the positions 'low,' 'high,' and 'second point' are assumed, the bayonet pointing as shown by the dotted lines in Fig. 7. The butt of the rifle is always kept well to the right side, the hand behind the trigger-guard, and the whole body in attitude to offer great resistance. In 'low,' the barrel is turned downward; but in all the other defensive motions it is held upward. The position of the arms is in each case that which would naturally be taken in placing the bayonet and musket in the required direction.

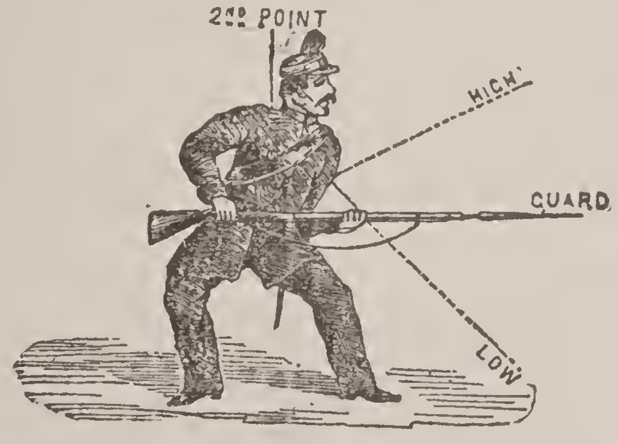


Fig. 7.

The offensive position of the body is acquired by the extension of the right leg, and bending forward of the left without moving the feet. The butt of the rifle is at the same time pressed firmly to the shoulder. This position is called 'point,' and constitutes an extension of the weapon in a direction parallel with either of those previously taken. As there were four 'guards,' so there are four points, which are shown in fig. 8. The barrel is in each case upward, and the motions for each are similar, except in pointing from '2d point,' when the rifle, seized by the right hand round the small of the butt, is thrust straight up above the head to the full extent of the arm, the left hand falling along the thigh, and the legs straightened so as to form an isosceles triangle.

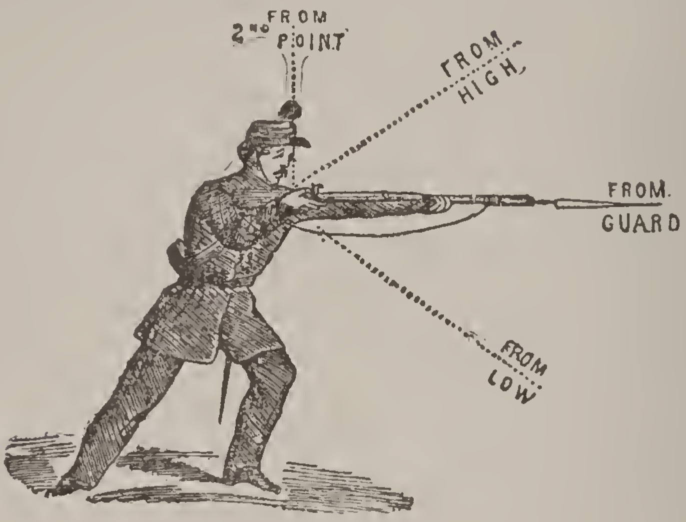


Fig. 8.

'Shorten arms' is a useful motion, both as a defense and as a preparation for a strong attack. It consists in carrying the butt back to the full extent of the right arm, while the barrel (downward) rests upon the thick part of the left arm. The body is thrown upon the right leg, and the left straightened. This powerful position is seen in the annexed cut.

In all the guards and points, and also 'shorten arms,' the bayonet may be turned directly to the front, to the right, or to the left, as circumstances may suggest. In contending with a swordsman, the action of changing from right to left, when at the 'high' or 'low,' is sufficient defense against the ordinary cuts of the latter.

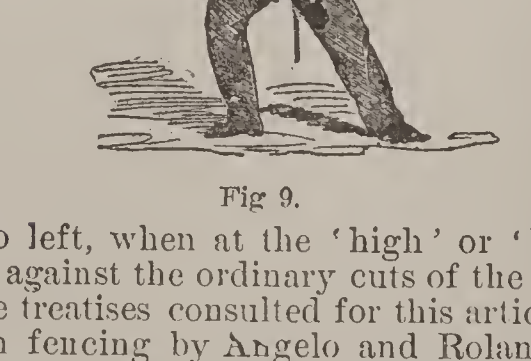


Fig 9.

Among the treatises consulted for this article have been the works on fencing by Angelo and Roland, as well as the shorter instructions issued by the military authorities.

FEND, v. *fĕnd* [contr. of Defend, which see]: to ward off; to prevent from entering; to parry a charge. Fend'ing, imp. Fend'ed, pp. Fender, n. *fĕnd'ėr*, that which defends; a metal article placed on the hearth before the fire; a piece of timber or coil of rope hung over a ship's side to prevent injury from rubbing against another surface. Fender-beam, n. the horizontal beam into which the posts of a saw-mill gate are framed at top; the inclined advance piece of an ice-breaker. Fender-bolt, n. in *ship-build.*, a bolt having a large head, which projects from the planking and serves as a fender to save the planks from being bruised. Fender-post, n one of the guiding stanchions of a saw-gate. Fender-stop, n. in *r. r. eng.*, a structure at the end of a line of rails, to stop the cars or engine.

FÉNELON, *fĕn'ėh-lon*, F. *fā-nŭh-lŏng* or *fān-lŏng'*, François de Salignac de la Mothe, Archbishop of Cambray: 1651, Aug. 6—1715, Jan. 7; b. in the château de Fénelon, province of Périgord, now in the dept. of the Dordogne; of a family which has given many celebrities to the church and to the state in France. His education was conducted at home till his 12th year, when he was transferred to Cahors, and afterward to the Plessis College in Paris. At the close of a most blameless collegiate career, he selected the priesthood as his profession, and entered, in his 20th year, the newly founded seminary of St. Sulpice, then under the celebrated Abbé Tronson, where he received holy orders 1675. Unlike many ecclesiastics of his own rank at that period, he gave his whole heart to his sacred calling. For some time after his ordination, he was employed in attendance at the hospitals, and in other parochial duties of the parish of St. Sulpice; and 1678 was named director of an institution recently founded in Paris for the reception of female converts to the Rom. Cath. faith. While in this office, he wrote his first work, *On the Education of Girls*, still a standard; and the gentleness, moderation, and charity with which he discharged his duties toward the young converts, led to his appointment as head of a mission, which, on the revocation of the Edict of Nantes 1685, was sent to preach among the Prot. population of Saintonge and Poitou. In 1688, he resumed his duties in the Maison des Nouvelles Converties, at Paris; and in the following year, he was named by Louis XIV. to the highly confidential post of preceptor of his grandson, the young Duke of Burgundy. F.'s management of this important and delicate trust showed how well he understood the true nature and objects of education. All his own instructions, and all the exercises enjoined upon his pupil, were so contrived, as, both to impart actual knowledge, and to prepare the mind and the heart of the pupil for the business of his life, by impressing him with a sense of responsibility of the great principles of truth and justice on which these responsibilities are founded, and of the hollowness and futility of all earthly glory, power, and happiness, which do not rest upon this foundation. To this wise design of the preceptor we are indebted for many works still popular in educational use: for the *Fables*, for the

Dialogues of the Dead, for the *History of the Ancient Philosophers*, for the germ at least of the *Telemachus*, and for the *Life of Charlemagne*, the manuscript of which last work, unfortunately, was burned in the fire which destroyed the archiepiscopal palace of Cambray, 1697. As an acknowledgment of these great merits, he was presented by the king, 1694, to the Abbey of St. Valery, and in the following year, to the Archbishopric of Cambray, which he accepted only on the express condition, that for nine months of each year he should be exempted from all duties as preceptor of the prince, and left at liberty to devote himself exclusively to his diocese. It is to this period of F.'s life that the history of the unhappy controversy about Quietism belongs. Without entering into the details of this singular revival of the ancient Mysticism (see MYSTICISM), it will be enough to say that two separate schools of Quietism are to be distinguished, the moral character, or at least the moral tendency, of which was exceedingly different: see QUIETISM. In one of these, the common mystic principle of the absorption of the soul in the love and contemplation of God, led to the conclusion, that the soul, in this state of absorption, became entirely passive; that it was thenceforth independent of the external world; that it suffered no contamination from the material actions of the outer man, and that no acts of virtue, not even of prayer, were any longer required: see MOLINOS. The other school, while it maintained the theory of passive contemplation and love, yet repudiated the dangerous and immoral consequences deduced therefrom. It was exclusively the latter and less objectional form of Quietism, whose professors for a time claimed, though not the patronage, yet at least the indulgent consideration of Fénelon. He formed, 1687, the acquaintance of the celebrated Madame Guyon, foundress of the French school of Quietism: see GUYON. The extraordinary piety and exemplary life of this remarkable woman, and his own natural bias toward the tender and lofty spirituality which he professed, appear to have blinded F. to the true nature and to the practical consequences of the system which she followed. Fully convinced of the unfairness of much of the outcry which was raised against her, and which made her responsible for all the principles of the grosser Quietism of Molinos, his generous mind was perhaps attracted to her cause by the very injustice of her opponents. He advised her to submit her works to the judgment of Bossuet, then in the zenith of his fame, with whom F. was in the most friendly relations. In the condemnation of the book of Madame Guyon by this prelate, F. acquiesced; but as she made a formal submission to the church, he refused to join in any condemnation of herself personally. Nevertheless, when a commission was appointed to examine the whole affair, F., though not a member, took part in the proceedings; and even suggested certain changes in their report, which he subscribed in common with the rest. To the articles prescribed for her signature by this commission, Madame Guyon readily subscribed; but it was further considered necessary not only to publish a condemnation of her several works, but also to prepare a special exposition of the true doctrine of the church on these questions. When the work of Bossuet on this subject was completed, he submitted it to F. for his approval. This F. not only refused to give, but even composed his own *Maxims of the Saints in the Interior Life*, in explanation and defense of certain at least of Madame Guyon's doctrines. He submitted his book to the Abp. of Paris, and introduced into it some modifications which were suggested by the diocesan censors. A violation of this, committed in the absence of F., was the last of a long train of causes which led to the painful and unedifying rupture between these two great prelates. F.'s book was received with much clamor, that of Bossuet was universally approved; and in the controversy which ensued, all the weight of the displeasure of the court, which F. had provoked by the covert strictures upon the existing state of things, in which he was believed to have indulged in his works of fiction, was brought to bear against him. He was ordered to submit his book to the judgment of an ecclesiastical tribunal, of which Bossuet was a member. F. refused to accept Bossuet as judge, on the ground that he had already prejudged the cause; and in the end he appealed to the judgment of the holy see. Unfortunately, even while the affair was pending at Rome, the controversy was still maintained in France. Bossuet published a succession of pamphlets. Several of the bishops who had espoused the side of Bossuet, issued pastorals in the same sense. F. defended himself vigorously against them all in several publications, explanatory as well of his principles as of the personal imputations in which some of his adversaries did not scruple to indulge. The last blow against the ancient friendship of the great rivals was struck by Bossuet in his celebrated *Relation sur le Quiétisme*. F. was wounded to the heart. The copy of Bousset's pamphlet which first came into his hands is still preserved in the British Museum; and the margin is literally filled with remarks, annotations, replies, denials, and rejoinders, in the singularly delicate and beautiful hand writing of the indignant archbishop. The copy in the British Museum is most probably one which, as we learn from his correspondence, he sent to his agent at Rome, and on the margin of which he corrected, for the guidance of his friend, the many false and exaggerated charges of his great antagonist. The substance of these replies he gave to the public in a most masterly defense, written, printed, and published within little more than a fortnight from the appearance of Bossuet's *Relation*. From this point, the controversy assumed a more personal, therefore a more acrimonious character; and it was maintained on both sides till the long delayed decision of the pope brought it to a close, 1699, March 12, by a brief, in the usual form, condemning the *Maxims of the Saints*, and marking with especial censure 23 propositions extracted from it. The conduct of F. under this blow constitutes, in the eyes of his fellow-churchmen, one of his highest titles to glory. He not only accepted, without hesitation, the decision of Rome, but he took the earliest occasion to publish from his own pulpit the brief of his condemnation; he issued a pastoral address to his flock, to apprise them of the judgment of Rome, and of his own cheerful acquiescence; and he presented to his cathedral a magnificent piece of church-plate, a gold ostensory, in which the Angel of Truth is represented trampling under foot many erroneous works, the most prominent of which bears the title of *Maxims of the Saints.* Bossuet is said to have been greatly touched by the conduct of his noble adversary, and to have earnestly desired a reconciliation. But the adverse influence of the king, Louis XIV., and of the court, stood in the way. The jealousy with which the political principles of F. were already regarded was heightened about this time into open hostility by the appearance of his *Telemachus* printed from a copy surreptitiously obtained by his servant, and which the king regarded as a masked satire on his own court: Sesostris being supposed to represent the Grand Monarque himself; Calypso, Madame de Montespan, Protesilaus, Louvois; and Eucharis, Mademoiselle de Fontanges. Louis's anger knew no bounds. F. was strictly restrained within his diocese; measures were taken to give the condemnation of his book every character of publicity; and what wounded him most of all, all intercourse with him, whether personal or by letter, was forbidden to his old and much-loved pupil, the Duke of Burgundy. From this date, F. lived exclusively for his flock. He founded at Cambray a seminary for his archdiocese, which he made his own especial charge. He was assiduous in preaching, and in the discharge of the other duties of his office; and the fame of his benevolence, charity, and enlightened liberality is attested by the order given in the campaign of 1709 to spare the palace and the stores of the Abp. of Cambray. The only later controversy in which he appears is the revival of the Jansenistic dispute in the well-known form of 'The Case of Conscience' (see JANSEN), in which F. engaged earnestly on the side of orthodoxy. The young Duke of Burgundy, notwithstanding the prohibition of his grandfather, retained all his old affection for his preceptor; and the highest hopes were entertained as to the future career of the pupil of such a school. These hopes were cut short by the premature death of the duke, 1712. F. survived him only about three years.

The works of F. are very voluminous. The latest collected edition extends to 20 vols. 8vo, and embraces great variety of subjects—theology, philosophy, history, literature, ancient and modern, oratory, especially the eloquence of the pulpit, asceticism, and spirituality in all its branches. His correspondence is very extensive and most interesting. Of his early sermons (one of which was delivered in his 15th year), a volume was printed 1744. Of his mature discourses, two only have reached us in a finished state. They are of the very highest order of sacred eloquence. Of the rest, we can judge only from the skeletons which it was his habit to prepare with great exactness, and of which very many have been preserved. His literary and historical works, many of which were composed for the instruction of his pupil, are filled with allusions and suggestions illustrative of the principles of government and of the relative duties of sovereigns and subjects, far in advance of the time in which he lived. His work on the *Temporal Power of the Mediæval Popes* presents that doctrine in its most amiable form; and even his spiritual writings in general may be read, and indeed are frequently read, not only without offense, but with positive advantage, by Christians of all denominations. See Card. Bausset's *Histoire de Fénelon* (3 vols. 1808–9); also *Vie de Bossuet* of the same author. See also the Life prefixed to the collected edition of *Œuvres de Fénelon;* the voluminous correspondence in that collection; *Vie de Fénelon*, by M. Gosselin; Wunderlich's *F.* (1873); and Hunnius, *Das Leben F.'s* (1873). An English biography, one-sided, but of some value, appeared anonymously 1877.—F.'s half-brother, FRANÇOIS DE SALIGNAC DE LA MOTHE F. (1641–79) was a missionary in Canada among the Cayuga Indians who had left N. Y., and settled on the Bay of Quinté.

FENESTELLA, n. *fĕn'ĕs-tĕl'lă*, or FENESTRELLA [L. a little window]: in *geol.*, an extensive genus of polyzoa or bryozoa resembling the recent lace-coral—so called from the net-like or window-like arrangement of its cells; 30 species are described from the Lower Silurian to the Permian systems. FEN'ESTEL'LIDÆ, n. plu. *-lĭ·dē*, the group to which the *fenestella* belong; the polyzoa or lace-corals.

FENESTER, n. *fĕn'ĕs-tér*, or FENÊTRE, n. *fē·nā'tr* [OF. *fenestré*, having many perforations: F. *fenêtre*, a window—from L. *fenestra*, an opening, a window]: an opening in a building for the admission of air and light; a window FENESTRATION, n. *fĕn'ĕs-trā'shŭn*, the form and arrangement of windows in a building. FENESTRA, n. *fén-ĕs'tră*, in *anat.*, one of two small openings in the bones of the ear. FENES'TRAL, a. *-trăl*, having openings like a window. FENES'TRATE, a. *-trāt*, pierced with holes of considerable size—applied to a leaf with holes in it.

FENIAN, n. *fē'nĭ-ăn* [Gaelic and Erse, *fine*, a family, a tribe, a clan]: used by Irish Fenians to signify the Irish as a nation *par excellence;* name of a notorious secret and political society among the Irish; a follower of *Fionn* or *Finn*, Fingal, the father of Ossian; applied to the Celtic poetry which celebrates the exploits of Finn and his clansman.—*The Fenians* are a political association of Irish or Irish Americans, the object of which is the overthrow of the English authority in Ireland, and the establishment of a republic. The etymology of the name has been the subject of some discussion. It is traced to the ancient Irish military organization called Fionna Eirinn, which took its appellation from the celebrated hero of Irish legend, Finn (or Fionn) MacCumhail. The accounts of this renowned body, with which the bardic literature of Ireland abounds, are most curious. It was designed as a national militia, and its origin is ascribed, by Keating, to Sedna II., monarch of Ireland about B.C. 400. In time of peace it consisted of three bodies, each formed on the model of a Roman legion, and consisting of 3,000 men; but in war, it was capable of being enlarged to any required limit. Candidates for enrolment were required to be of honorable family, to be irreproachable in morals, and to bind themselves to observe the laws of justice and morality; they were required to be of a certain height, and strong, supple, and vigorous of body; each being submitted, before enrolment, to an ordeal, in which his powers of speed, strength, endurance, and courage were tested by trial with his future comrades. The bardic accounts of some of those conditions are extravagant and amusing, but the generally historical character of the institution is unquestionable; and it subsisted until the reign of Carbry, son of Carmac MacArt, by whom the body of Fionna Eirinn was disbanded, and the members having, in consequence, transferred their allegiance to Mocorb, King of Munster, suffered an almost total extermination in the battle of Gavra, A.D. 284, which formed the theme of many a bardic poem from the days of Oisin (known in Gaelic legend as Ossian), son of Finn MacCumhail.

Adopting the name of this ancient military association, the modern Fenians (or Finians) are a secret association for the purpose of overthrowing the alien ascendency of the Saxon, and of restoring to the ancient Celtic population their legitimate status and influence in their native country. It had its first seat in America, where the Irish population largely increased after the famine of 1846–7. Many of the emigrants being driven from their homes by arbitrary ejectment, or from inability to pay rent, carried with them a sense of bitter wrong, which prepared them for almost any enterprise which promised revenge. Others had been sympathizers, if not participators in the insurrection of 1848; and almost all were deeply imbued with general political and social discontent. By all these, the prospect of a secret organization for the establishment of Irish independence was eagerly accepted. The most openly active seat of the organization was in the western states, especially Chicago; but the movement was directed from New York, and possessed ramifications in almost every large city of the Union. It was conducted by a senate, and consisted of 'circles,' each directed by a centre. The duty of the centres was to enrol members, who bound themselves, generally by oath, 'to be faithful to the Irish Republic as at present virtually established;' to instruct and practice them in military exercises; to raise funds for the purposes of the association, especially for purchase of arms and munitions of war; and to extend the organization by every means. Agents were sent into Ireland, and to the chief seats of the Irish population in England; and while the work of secret enrolment was industriously carried on in Ireland, measures were openly concerted in America. for raising funds by private contributions, and for pur chase of ·arms and military stores. Opportunely for the enterprise, the termination of the civil war in America set free a large number of military adventurers who had served as privates or as officers in one or other of the American armies, and whose experience of service was turned secretly but actively to account in the training of the young recruits enrolled in the Fenian conspiracy in Ireland. Newspapers, moreover, both in America and in Ireland, were established or subsidized for the purposes of the conspiracy; and journals, broadsides, ballads, and other inflammatory publications were largely circulated among the peasantry and artizans. Taverns, alehouses, and other places of entertainment were ordinary places of meeting; and one of the most formidable of the plans of the conspiracy was an organized attempt to seduce the Irish soldiers in the British army from their allegiance, and to prepare the way for their deserting to the ranks of Fenianism, when it should have reached the expected degree of maturity. It became apparent that in this, unlike almost all similar movements, pains were taken by the organizers to exclude the Rom. Cath. clergy—by whom the Fenian confederation had from the first been steadily resisted—from all knowledge of its character and objects, as well as of the names or number of its members in the several localities; and many of the most active of the leaders were distinguished by the freedom of their religious opinions, and by their unconcealed disregard of clerical authority.

For a time, these designs were carefully concealed, and, even when a certain publicity was given to them, the scheme appeared so wild and impracticable that it was regarded as an attempt, on the part of a body of unprincipled adventurers, to practice upon the patriotic susceptibilities of the ignorant and excitable Irish, especially in America. By degrees, however, the movement acquired more solidity, and the government ascertained that Fenianism, however corrupt in some of its sources, and however wild and extravagant in its aims, was nevertheless a reality with which it had become necessary to grapple. Measures were taken with great promptness and determination. The Habeas Corpus Act having been summarily suspended, all the known leaders in Dublin and in the provincial districts of

Ireland (most of them Irish-Americans) were at once placed under arrest. The chief journal of the conspiracy was suppressed and seized, additional troops were moved into Ireland, and other measures of repression were vigorously carried out. By these energetic measures, public tranquillity was maintained in Ireland; and, though prosecutions were instituted and a few individual conspirators convicted, so universally was the Fenian movement condemned by the public opinion of the country that most of the prisoners were discharged on condition of their leaving Ireland. But, though thus in appearance extinguished, the embers of discontent continued to smolder among the poorer peasantry and the working population of the towns; and a certain prestige was given to the fallen cause by the escape from prison, under circumstances of much mystery and a high degree of romance, of the most active and crafty of the leaders of the conspiracy. His return, and that of other exiles, to America, renewed the agitation in this country. In the early summer of 1866, a raid was attempted into Canada, and, though it proved so utter a failure as to cover its projectors with ridicule, an organization was secretly pursued, both in America and in Ireland, which resulted, in the spring of 1867, in an insane and utterly abortive attempt at insurrection at home. The plan of the conspirators was to seize the castle and military stores at Chester, and, having cut off telegraphic communication, to convey these arms to Dublin, and effect, throughout the country, a simultaneous rising in concert with the enterprise at Chester. The attempt was defeated though the treachery of one of the conspirators, by whom the plot was revealed. A partial insurrection, however, took place, concurrently with the intended attack on Chester, in the county of Kerry; and a few weeks later, a more extensive movement was attempted in the counties of Dublin, Louth, Tipperary, Limerick, and Cork. But the persons engaged in it were for the most part either American and Irish-American adventurers, or artisans, day-laborers, and mechanics, generally unprovided with arms, and in many cases scarcely beyond the years of boyhood. The only military enterprises undertaken by them consisted in a series of attacks on the barracks of the rural constabulary, in almost every instance unsuccessful; most of the parties dispersed, or were made prisoners after a single night's campaign. The rest betook themselves to the mountains, and after a few days of exposure and hardship, in which they managed to evade pursuit, and carefully avoided all encounter with the military, they were either captured or dispersed. The leaders were tried at a special commission in the spring of 1867, and tranquillity for a time seemed restored in Ireland. Much discontent, however, continued; and as the foreign organization was uncontrolled, and was still maintained, it remained as a standing element of danger and a persisting incentive to domestic disaffection. Considerable alarm was created in England and Scotland by the extent and daring of the organization among the Irish population of the large manufacturing towns. In 1867, Sep., an attack was made, in open day, on a police-van in Manchester; the officer in charge was killed, and the prisoners, suspected Fenians, were released. A few weeks later, a still more daring attempt was made to blow down Clerkenwell Prison wall, with the same object. Alarms were circulated of intended burnings in the cities and towns; gunsmiths' shops and even government stores of fire-arms were broken open and pillaged; and a vague but wide-spread feeling of apprehension was for a time created. In 1869, the Fenian Brotherhood was formally chartered in the United States under the act for incorporating benevolent societies. The U. S. government, 1871, frustrated another Fenian raid on Canada by the apprehension of its leaders and the seizure of its arms. At the tenth congress of the brotherhood, 1871, it was reported that in about 12 years above $626,000 had been raised, of which $425,000 was expended 'for Irish revolutionary purposes direct.' Gradually the Fenian prisoners whose offense was political merely were released. The disestablishment of the Irish Church, 1869, and the Land Act, 1870, removed some grievances. The action of the Home Rule party (see HOME RULE) was kept within constitutional bounds. In 1879, Oct , the extreme section of the Home Rulers constituted the Land League, which formally insisted on fixity of tenure, fair rents, and free sale (of tenant right); and demanded, publicly but unofficially, the stoppage of all evictions and the abolition of 'landlordism.' The agitation conducted by this body was accompanied by armed intimidation and outrage. Its funds came mainly from America, and were understood to be largely derived from Fenian sources. The *Skirmishing Fund* was promoted by an Irish party in the United States, who advocated the free use of dynamite for the destruction of English public buildings and English commerce. The 'Patriotic Brotherhood' seems to have been one of several societies sprung from the F. Society; and many of the 'Invincibles,' who were to 'make history' by removing tyrants, and were the chief agents in the assassinations of the Irish Secretary and others in 1881 and 1882, had been Fenians. See IRELAND: HOME RULE.

FENN, *fĕn*, HARRY: artist; b. Richmond, England, 1838, Sep. 14. He came to the United States 1856, established himself as an artist and designer on wood, and soon attained wide fame by his book-illustrations. Shortly after the close of the civil war, he travelled extensively through the southern states and made sketches and drawings for a series of articles on *The New South*, for *Appleton's Journal.* Subsequently his travels were renewed through the United States and Canada for the purpose of procuring sketches for *Picturesque America;* and on the completion of that work he visited Europe, Egypt, Palestine, and the Sinaitic peninsula, making sketches for *Picturesque Europe*, and *Picturesque Palestine.* He was a founder of the American Water-color Society.

FENNEC, *fĕn'ĕk*, or ZERDA, *zĕr'da* (*Megalotis*): genus of *Canidæ*, peculiar to Africa, resembling foxes in general form and in the bushy tail, but having eyes adapted for diurnal, and not for nocturnal, vision, and remarkably large ears. The species are small and beautiful. They feed partly on dates and other vegetable food; also on eggs, and on insects, which they adroitly snap as they pass.

FENNEL, n. *fĕn'nĕl* [AS. *feonel;* L. *fœnĭcŭlŭm,* fennel], (*Fœniculum*): genus of umbelliferous plants, allied to Dill (q.v.), but destinguished by the cylindrical, strongly ribbed fruit. The flowers are yellow. All the species are aromatic, and have much-divided leaves with thread-like segments. The best known is the COMMON F. (*F. vulgare*), native of the s. of Europe and parts of England, and abundant in parts of the United States. It is a biennial, three or four ft. high, cultivated in gardens chiefly for its leaves, which are boiled and served up with mackerel, with salmon, and occasionally with other kinds of fish, or are used to form a sauce for them.—SWEET F., ITALIAN F., or CRETAN F. (*F. dulce*), is a more tender plant, of much humbler growth, and annual, much cultivated in the s. of Europe; by some it is regarded as the same with the Common F. The young sprouts from the root are sweeter and less aromatic than those of Common F., and, when blanched, are a very agreeable salad and pot-herb. The fruit (seed) is longer and paler than that of Common F., has a more agreeable odor and flavor, is the favorite aromatic condiment of the Italians, and is used in medicine as a carminative and aromatic stimulant. The seeds of a species of F. are occasionally called caraway-seeds, though with doubtful correctness. *Oil of F.*, an aromatic, stimulant, and carminative essential oil, also is made from it.—CAPE

Fennel (*Fœniculum vulgare*):
a, a flower.

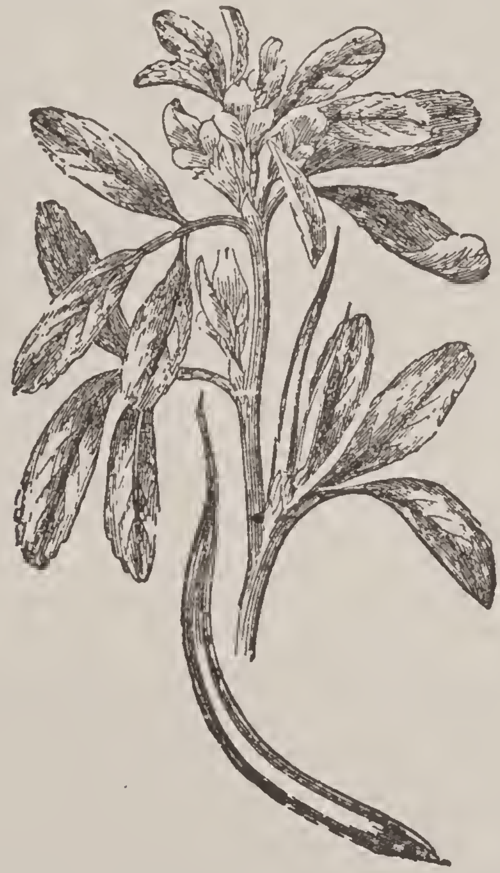
F. (*F. Capense*), found in the interior of the Cape of Good Hope, has a thick, aromatic, esculent root.—The Panmuhooree of India (*F. panmorium*) is a species of F. much cultivated in its native country for its sweet, warm, and aromatic fruit, which is used as a carminative and in curries.—The Giant F. of the s. of Europe is a plant of a different genus (*Ferula*), and abounds in a fetid juice. It is indeed closely allied to asafœtida, but forms a favorite food of buffaloes in Apulia, where it abounds. The dry dead stem is full of a white pith, used in Sicily as tinder.

FENNY: see under Fen.

FENRIR: see Scandinavian Mythology.

FENT, n. *fĕnt* [F. *fente*, a slit]: the opening left in an article of dress (as in the sleeve of a shirt, the skirt of a gown), for convenience in putting it on; a placket.

FENUGREEK, n. *fĕn'ū-grēk* [L. *fœnum*, hay: *Græcum*, Greek—*lit.*, Greek hay], (*Trigonella*): genus of plants of nat. ord. *Papilionaceæ*, sub-order *Leguminosæ*, allied to clover and melilot. The plants are small and creeping, with pink or white flowers. The leaves have three obovate leaflets and scythe-shaped stipules. The flowers generally have the *keel* very small, so that the *wings* and *standard* present the appearance of a tripetalous corolla. The Common F. (*T. fœnum Græcum*) is a native of the s. of Europe and of parts of Asia; it is much cultivated in India as a fodder-plant, and derives its name (*Fœnum Græcum*, Greek hay) from its use as fodder in Greece. Its pods are many-



Fenugreek (*Trigonella fœnum Græcum*).

seeded and cylindrical; its seeds have a strong, peculiar smell, and an oily, bitter taste; the flour made from them is used for emollient poultices, but only in veterinary practice. The seeds of F. were formerly in great esteem in medicine.—Another species (*T. incisum*), growing spontaneously in many parts of India, is much used as fodder for cattle. The legumes of the ESCULENT TRIGONELLA (*T. esculenta*), also an Indian plant, are used as human food.

FENWICK, *fĕn'wĭk*, GEORGE: colonization agent of Lords Say and Brook. He came to America, 1636, to take charge of the Saybrook Plantation, in Conn., and, after a short visit to England, governed and superintended the colony, 1639–44; when he sold the plantation to the Conn. Colony, and returned to England. He was a col. in the parliamentary army, a judge at the trial of Charles I., and died 1657.

FENWICK, JOHN: 1618–83; b. England: colonist. He was a Quaker; obtained a grant of land in w. N. J. 1673; founded a colony at Salem 1675; was imprisoned by Gov. Andros, who disputed his proprietorship, 1678–81; transferred his claim to William Penn; and died poor.

FENYES, *fĕn-yĕsh*, ELEK (Alexius): Hungarian geographer and statistical author: b., 1807, at Csokaj, county of Bihar. He became barrister-at-law, 1829, but began travelling over the country to gain acquaintance with the state of the Hungarian kingdom, of which there had never been an authentic survey. His first work appeared 1840, *Hungary and Its Annexed Parts, Geographically and Statistically Considered* (6 vols. Pesth), and secured the great prize of 200 ducats from the Hungarian Academy. *The Statistics of Hungary*, 3 vols., followed (1843); *General Atlas for Hungary* (1845); *Description of Hungary* (1847); *Geographical Dictionary of Hungary* (1851)—all published at Pesth. All F.'s works are in the Magyar tongue, but several have been translated into German and repeatedly published. They are the first true presentations of the state of Hungary; and, for completeness, solidity, and exactness, they will bear comparison with the best works in their department in European literature. During the national government of Hungary (1848), F. was chief of the statistical section. Many years ago, F.'s health failed and he retired into private life.

FEOD, *fūd:* see under FEUDAL.

FEODO'SIA, or THEODO'SIA: see KAFFA.

FEOFF, n. *fĕf* [Norm. F. *feoffer*, to invest with a fief—from *fief*, a fief]: another spelling of FIEF (q.v.). FEOFFMENT, n. *fĕf'mĕnt*, act of granting possession. FEOFFEE, n. *fĕf-fē'*, the person who receives or holds a feoff. FEOF'FER, or -FOR, n. *-fĕr*, the granter of a feoff.—*Feoffment* is the oldest, and long was the only, method for the conveyance of land known in England. Feoffment consisted in the formal conveyance of the land from the feoffer to the feoffee, the former stating distinctly the measure of the estate conferred, whether it was in fee, in tail, or for life. Where no mention of the duration of the estate was made, the gift was presumed to be for life. This conveyance of the land, in order to be complete, required to be accompanied by delivery of sasine (q.v.). Livery of sasine was of two kinds, viz., by deed, and in law. In the former case, the parties being actually upon the land, the feoffer, by delivery of a twig or a turf, testified his conveyance of the land. In livery in law, the parties being in sight of the land, the feoffer referring to the land gave possession to the feoffee. This mode of feoffment was ineffectual unless the feoffee entered into possession during the life of the feoffor. Livery in deed might be effected by attorney; but livery in law only by the parties themselves. In the earliest times these ceremonies completed the conveyance. But by degrees the practice of embodying the transaction in a deed was introduced. When a deed was used, it became customary, but not essential, to indorse on the deed the fact that livery of sasine had been made. By later laws a feoffment is void unless accompanied by deed, and the formerly possible 'tortious conveyance' was ruled out. It must be observed that the practice of feoffment above described, and which has existed in England from time immemorial, differed materially from the old form of investiture in use in strictly feudal times, and from that which still prevails in Scotland. In England, the transaction was simply a conveyance by the actual holder of the land to a new tenant, testified by certain ceremonies, but requiring no confirmation by a third party to complete it. But by feudal usages every holder of land was the vassal of some superior lord, to whom he owed suit and service, and without whose consent he could not even part with his land; hence no conveyance was complete without the reception of the new tenant by the lord paramount as his vassal. In like manner, to this day, in Scotland, no transfer of heritage is complete without the formal confirmation of the superior, though by recent legislation the old feudal usages have been abolished. See INFEFTMENT: SASINE: FEUDAL SYSTEM.

Feoffment to Uses.—A former application of the feudal form of *feoffment* in England in order to effect a conveyance in trust. The common-law courts, adhering to feudal rules, refused to recognize any interest in the land but that of the person actually infeft; but where a feoffment was made to one man *to the use* of another, the equity courts gave effect to the transaction by compelling the party infeft to hold in trust for the third person, called the *cestui que use:* see USES.

FE'RÆ [Lat. *ferus*, wild]: in the Linnæan system of zoology, an order of *Mammalia*, nearly corresponding to the *Carnaria* (q.v.) of Cuvier.

FE'RÆ NATU'RÆ [Lat. of a wild nature]: term in Roman law for animals which flee the dominion of man, whether beast, bird, or fish, and retain their natural freedom. According to that system, such animals became the property of any one who might catch them, irrespectively of the ownership of the soil on which they were taken, on the principle that 'natural reason gives to the first occupant that which has no owner.'—*Inst.* ii. tit. i. s. 12. But this regulation did not prevent the prohibition of trespass. 'Of course, any one who enters the ground of another for the purpose of hunting or fowling may be prohibited by the proprietor, if he perceives his intention of entering' (*Ib.*). This right on the part of the proprietor did not affect the property of the animal taken, though it gave him an action against the trespasser. If a wild animal escaped from its captor, his proprietorship instantly ceased, and the animal might again be appropriated by its captor. This occurred even though the animal was not out of sight, if it could not be pursued without great difficulty. Even a wounded animal was not the property of the sportsman till it was caught, though the point which is decided in this sense (*Inst.* ii. tit. i. s. 13) is said to have been one on which difference of opinion had prevailed. Except so far as modified by the statutes (see GAME-LAWS), these provisions form part of the common law. Under feræ naturæ, the law of Rome included *bees,* unless included in a hive, or unless the proprietor be in pursuit of them, and has kept them in sight: see BEE. Domestic animals, though they stray, do not cease to be the property of those to whom they have belonged; but as regards animals which have a tendency to return to a state of nature, the rule of the Roman law was, that property in them continued so long as they had the intention of returning (*animum revertendi*), or rather, the habit of doing so. This rule applied to peacocks and pigeons, but not to fowls and geese; fowls and geese, though frightened and in flight, were still private property, so that whoever detained them with a view to his own profit, was guilty of theft. See DOVECOT: WARREN: FOREST LAWS: FISHES, ROYAL.

FERAL: see under FERINE.

FER DE LANCE, *făr-dē-lângs;* exceedingly venemous serpent, found in the sugar plantations of Brazil and the W. Indian Islands, dreaded alike by man and beast. It often attains a length of 8 ft., gives no warning of its intended attack, and its bite is usually fatal. It belongs to the rattlesnake family, its tail terminates in a horny spike, and when in pursuit of prey it springs to a great distance.

FERDINAND, *fėr'dĭ-nănd,* Ger. *fĕr'dē-nânt,* I., Emperor of Germany: 1503–64 (reigned 1556–64); b. Spain; son of Philip I., and brother of Charles V. whom he succeeded in the empire 1556, having been previously elected king of Rome. F. had married, 1521, Anna, daughter of Ladislaus VI., King of Bohemia and Hungary. When her brother Louis fell in battle with the Turks 1526, leaving no issue, the crown was claimed by F. in right of his wife. This involved him in a long and bloody struggle with a rival, John of Zapolya, who laid claim to Hungary, and who, as well as his son Sigismund, was supported by Soliman, Sultan of the Turks. F. at last gained the upper hand, bought off the Turks by a yearly tribute, and finally secured Hungary and Bohemia to the House of Austria. When he was elected emperor, the concessions that he had made to the Protestants caused the pope, Paul IV., to refuse to acknowledge him. The pope's successor, Pius IV., was more complaisant; but the electors resolved that for the future the consent of the pope should not be asked, and this was carried out. F. made several attempts to reconcile the Protestants and Rom. Catholics, and urged on the Council of Trent, though fruitlessly, the reformation of abuses He left the reputation of a prudent and enlightened ruler, and was succeeded by his son, Maximilian II.

FER'DINAND II., Emperor of Germany: 1578, July 9—1637, Feb. 15 (reigned 1619–37); b. Gratz; grandson of Ferdinand I.; and son of Charles, Archduke of Styria, younger brother of Maximilian. F.'s mother, Maria of Bavaria, early inspired him with hatred against the Protestants. He was educated by the Jesuits at Ingolstadt, with Maximilian of Bavaria; and at Loretto, he had taken a solemn oath, before the altar of the Mother of God, to reinstate Rom. Catholicism as the sole religion of his dominions, at any cost. As soon as he succeeded to the government of his own duchy of Styria, he set about putting down Protestantism by force. He attempted the same in Bohemia and Hungary, of which countries he had been elected king during the lifetime of Matthias Corvinus; but though at first unsuccessful, and even in danger of losing his dominions, he ultimately managed, with the aid of the Rom. Catholic league and of Elector George I. of Saxony, to subdue them. Bohemia lost all its privileges. By hanging, confiscation of property, and the banishment of innumerable families, the wretched land was reduced to obedience; and the introduction of the Jesuits, and rigorous persecution of Protestants, re-established Rom. Catholicism. Meanwhile, F. had been elected emperor of Germany (1619). The war, which properly ended with the subjugation of Bohemia, was at the same time transferred to the rest of Germany, and took the character of a religious war—the famous 'Thirty Years' War' (q.v.). The two imperial generals Tilly and Wallenstein, were opposed by a confederacy of the Prot. states of Lower Saxony, with Christian IV. of Denmark at their head; but the confederates were defeated by Tilly at the battle of Lutter, in Brunswick, and forced to conclude peace (Lubeck 1629). Confident in the ascendency which he had acquired, F., in the same year, issued an Edict of Restitution for the whole of Germany, taking away from the Protestants nearly all the rights that they had acquired by a century of struggles; and the troops of Wallenstein and of the league were immediately set to work to carry it out in several places. But further proceedings were soon arrested by the dismissal of Wallenstein, on which the diet of the empire at Regensburg had insisted; and by the opposition of Richelieu, who put every wheel in movement to curb the power of the House of Austria. At this time also, a formidable opponent to the schemes of the emperor appeared in the person of Gustavus Adolphus of Sweden (q.v.). After the murder of

Wallenstein, the connivance at which is an ineffaceable blot on F.'s memory, the imperial commander, Gallas, gained the battle of Nordlingen 1634, which had the effect of detaching Saxony from the Swedish alliance; but the ability of the Swedish generals, for whom Austria had none that were a match, and the open part that France now took in the contest, brought back the balance of victory so far to the Prot. arms. that when F. died, he had given up the hope of ever attaining his objects. His reign is one of the most disastrous in history; for Germany owes him nothing but bloodshed, and misery, and desolation.

FERDINAND III., Emperor of Germany: 1608, July 11—1657, Apr. 2 (reigned 1637–57); son of Ferdinand II. He was not so much under Jesuitical and Spanish influence as his father. Having accompanied the armies in their campaigns after the death of Wallenstein, he had witnessed the miseries of war, and was inclined to peace; but the conflicting interests of the individual belligerents hindered any unity of view, and made it necessary to proceed with the contest. Thus was this miserable war protracted, ever extending in circuit, and increasing in devastation owing to the growing licentiousness of the soldiery. At last, 1643, a congress met at Münster to arrange terms of peace, which was concluded 1648, known as the Peace of Westphalia. At the diet of the empire, 1653–4, the last presided over by an emperor in person, F. effected important alterations in the administration of justice. He died shortly after concluding an alliance with Poland against Sweden. His son, Leopold I., succeeded him in the German empire.

FER'DINAND I., Emperor of Austria: 1793, Apr. 19—1875, June 29 (reigned 1835–48); b. Vienna; eldest son of Francis I. by his second marriage with Maria Theresa of the House of Naples. He was from the first of a weak constitution, and was unfortunate in those to whom his education was intrusted. Yet he showed on all occasions a goodness of heart, which was fostered by the example of his uncle, the Archduke Charles, to whom he was much attached. While crown-prince, he travelled through his Italian provinces, Switzerland, and part of France, and took great interest in manufacturing industry. In 1835, he succeeded his father on the throne. It was expected from his character that he would inaugurate a more liberal policy than his predecessors had pursued, but the absolutist principles that seemed destined to rule for ever the Austrian cabinet, triumphed, and Metternich was allowed to carry on the government. It now became obvious that F. sadly lacked moral decision, and his 'goodness' exhausted itself in numerous acts of clemency and benevolence. Nevertheless, during his reign, the industry of Austria made great advance, and the great network of railroads and highways was begun. The insurrection in Galicia 1846, led to the annexation of Cracow to Austria. No country was more affected by the European movement that began in the winter of 1847–8 than Austria, though the revolutionary storms that shook the empire cannot be attributed to any want of good-will to his people on the part of F., but only to a complete lack of political wisdom. On the disturbances breaking out in March, he consented to the dismissal of Metternich, the appointment of a responsible ministry, and granted the outlines of a constitution. In May, he retired with his court to Innspruck, but was induced to return to the capital in August. At last, the October insurrection in Vienna caused him again to leave the palace of Schönbrunn, and retire to Olmütz, where, 1848, Dec. 2, he abdicated in favor of his nephew, Franz Joseph. He afterward resided at Prague, where he died. He married, 1831, Feb. 27, Caroline, daughter of Victor-Emmanuel I., King of Sardinia, but had no children.

FER'DINAND I. (THE JUST), King of Aragon and Sicily: 1379–1416 (reigned 1412–16); younger son of John I. of Castile and Leonora of Aragon. In 1406 he refused the crown of Castile when offered by the nobles on the death of his brother Henry III., but accepted the regency as his brother had desired during the minority of John II., his nephew. He obtained signal victories over the Moors with his army and navy, and directed the domestic affairs of the kingdom with a liberal and prudent hand. When Martin, King of Aragon and Sicily, his uncle on his mother's side, died, he was brought forward as a candidate for the throne, and supported with much zeal by a strong party in the state, though he had no claims under the laws of descent. The manifestation in his favor became so strong that the question of succession was referred to a body of 9 judges, representing Catalonia, Valencia, and Aragon, and he was elected 1412. He deferred his coronation till after he had subjugated his rivals, and on the defeat of Count Jayme of Urgel at Balaguer, his last opponent, the ceremony was performed at Saragossa 1414. In the same year he was a stanch supporter of the claims of the Spaniard, Benedict XIII. (Peter de Luna), at the council of Constance, when the papal schism was at its height, and three rival popes were claiming the obedience of the faithful. In the following year John XXIII. was deposed and Gregory XII. abdicated. These events prepared the way for peace, and F., anxious to have the unity of the church restored, took part in a conference between Sigismund and representatives of France, Castile, and Navarre, and renounced obedience to the Spanish papal claimant. F. was succeeded by his son Alphonso V., known as the conqueror of Naples.

FER'DINAND II., King of Aragon and Sicily: see FERDINAND V. (THE CATHOLIC), of Castile.

FERDINAND I., King of Naples: 1423–94 (reigned 1458–94); illegitimate son of Alphonso V. On the death of his father, who had ruled Naples, Sicily, Aragon, and Sardinia, he received the throne of Naples 1458, and entered upon a troublesome reign. Many of the most powerful nobles conspired to aid John of Anjou in seizing the country. John invaded the kingdom and defeated F. at Nola 1460, from which F. fled to his capital with but

20 followers. In his dire extremity Pope Pius II., the Duke of Milan, and the Albanian chief Scanderbeg, came to his relief, and the latter, assuming command of the army, defeated John at Troja and forced him from Italy 1462. In 1480 the Turks descended upon Italy and took Otranto, but F. recovered the city the next year. The nobles again revolted 1485, when he appeased them with promises that he afterward broke· he was excommunicated by Pope Innocent VIII. 1489, but regained his favor 1492; and died while the expedition of Charles VIII. of France was on its way to invade Italy.

FER'DINAND III., King of Naples:s ee **Ferdinand** V. (The Catholic), of Castile.

FER'DINAND I. (The Great), first king of independent Castile: 1000–1065, Dec. 27 (reigned 1033–65); second son of Sancho el Mayor, King of Navarre. In 1026 his father compelled Bermudo III., King of Leon, to surrender his rights over Castile, and to give his sister Dona Sancha in marriage to F., then regent of that province. The marriage was consummated and F. received the title of king of Castile 1033. Sancho died 1035, after dividing his possessions among his four sons, giving to F. Castile, which was henceforth recognized as an independent sovereignty. Shortly after the death of Sancho, Bermudo attempted to recover his lost possessions, but was defeated and slain by F. in the battle at Lantada near Rio Carrion 1038. F. then claimed and received the crown of Leon, in right of his queen, and entered upon a conciliatory and equitable reign which soon won for him the esteem and support of his new subjects. He gained a considerable portion of Portugal by invasion and conquest 1045; extended the Christian frontier from the Douro to the Mondego and reduced to vassalage the emirs of Toledo, Saragossa, and Seville, by his wars against the Moors 1046–49; and secured a large portion of territory belonging to Navarre and made himself the most powerful among the Christian princes in the peninsula by defeating his brother, Garcia III., King of Navarre, who had invaded his possessions, in a battle at Atapuerca near Burgos, 1053. About 1055 F. assumed the title of emperor. with a view of indicating his supremacy in Spain; but the act was held by the emperor Henry III. to be an infringement of his own rights of suzerainty, and his complaint was sustained by Pope Victor II. Subsequently a decision was given favoring F.'s imperial claims so far as they covered the territory that he had wrested from the Moors. In 1063 he forced the emir of Seville to restore to him the relics of St. Isidro; and in 1065, while on an expedition against Valencia, he was seized with a mortal sickness, and returning to his capital, Leon, divided his possessions among his three sons, and spent his last days in rigid devotional exercises.

FER'DINAND II., King of Leon: 1136–88 (reigned 1157–88); younger son of Alphonso VIII. On the death of his father he received the kingdom of Leon, that of Castile having been bequeathed to his brother Sancho III. In

1158 his possessions were invaded by Sancho, who took advantage of a rupture between F. and his most powerful nobles, and F. was forced into submission to his brother. Sancho died shortly afterward and then F. took possession of Castile under the pretense of guarding the interests of his nephew Alphonso III. thereby, and held it till Alphonso's marriage with Leonora, daughter of Henry II. of England, 1170. F. became involved in a war with his father-in-law, Alphonso I. of Portugal, by repudiating his wife, and defeated and captured him at Badajoz 1169. He waged war successfully against the Moors, and instituted the military order of Alcantara.

FER DINAND III. (SAINT), King of Castile and Leon: 1200–52 (reigned 1217–52); son of Alphonso IX. of Leon, and of Berenguela, sister of Henry I. of Castile. His uncle died without issue 1217, and through his mother's influence the title of Blanche, the elder of the surviving sisters, was set aside, and the crown given to F. By wise administration he gained the support of the chief towns and the most powerful nobles, and (1225) began a career of conquest which effectually broke the Moorish power in Spain. His father died 1230, and in his will declared his marriage with Berenguela void, and designated his two daughters by his first marriage his successors. F. interrupted his Mohammedan crusade long enough to insure his own inheritance and thus permanently united the kingdoms of Castile and Leon under one crown. Resuming his military operations he conquered Ubeda 1234, Cordova 1226, Jaen 1245, and Seville 1248, the latter surrendering Nov. 23, after a siege of nearly two years. While planning an invasion of Africa, he died in Seville 1252, May 30, bequeathing his kingdon to his eldest son Alphonso X. F. was distinguished as much for religious zeal as for military prowess. He was an uncompromising enemy of the Jews and Albigenses, who had sought asylum in his possessions; founded the Univ. of Salamanca, 1243, which his son nobly fostered; had the code of Visigothic laws translated into the vulgar tongue; was popularly known as *el Santo* from an early age because of his devotion to the Rom. Cath. Church; and was canonized by Pope Clement X. 1671, his day in the Spanish calendar being that of his death.

FER'DINAND IV., King of Castile and Leon: 1285–1312 (reigned 1295–1312); son of Sancho IV. He succeeded his father when 10 years old, and at once had his possessions contested by his uncle Enrique who was anxious to become regent, by Don Juan Nunez de Lara who wanted to enlarge his estates, and by his cousins the infantes of La Cerda, who first claimed the crown and then aspired to a division of the kingdom. Through the shrewdness of his mother, Maria de Molina, these several schemes were frustrated. The king of Portugal was conciliated and gave his daughter Constanza in marriage to F., and an alliance was effected with the king of Aragon. As soon as F. was secure in the possession of his throne, he resumed the policy of war against the Moors, and was pecuniarily aided by

Pope Clement V. and his own nobles. He took Gibraltar 1309, and on the extinction of the order of Templars by the Pope 1310, confiscated their property and shared it with other orders of chivalry. He died suddenly at Jaen, 1312, Sep. 7, and was succeeded by his infant son, Alphonso XI.

FER'DINAND THE CATHOLIC, King of Spain—V. of Castile, II. of Aragon, III. of Naples, II. of Sicily: 1452. Mar. 10—1516, Jan. 23 (reigned 1474–1516); son of John II., King of Navarre and Aragon. In 1469 he married at Valladolid, Isabella, sister of Henry IV. of Castile. Even in the lifetime of his father, events were paving the way for the union of the two kingdoms of Castile and Aragon. On the death of Henry IV. of Castile, 1474, the cortes refused to acknowledge the legitimacy of his daughter Juana, and proclaimed Isabella and her husband F. joint-sovereigns. A war ensued, in which they were completely successful. In 1479, F. becoming king of Aragon on the death of his father, the two kingdoms of Aragon and Castile were united in the persons of F. and Isabella. Isabella, however. as long as she lived, maintained her position as queen of Castile, and allowed her husband no other share in the government than the privilege of affixing his signature to the decrees, and of uniting his arms with her own. F.'s whole reign was an uninterrupted series of successful wars. In Castile, he distinguished himself by the effectual suppression of the banditti, who had become formidable in the confusion resulting from the civil wars. This he accomplished by re-organizing and putting in force against them the *hermandad*, or brotherhood, a kind of Spanish militia, composed of the citizens and the country-people. But F., whose craft and vigor were quite Machiavelian, was not content with taking strong measures against the Castilian outlaws; he resolved also to break the power of the feudal nobility, and made good use,of the *hermandad* in carrying out this design. Cities and towns were encouraged to make themselves independent of the nobles, who were deprived of many important privileges, and among other humiliations, were subjected to the ordinary tribunals of justice. The establishment of the Inquisition 1478–80, though primarily and mainly intended to further 'religious' ends, likewise helped to lessen their influence. F. strengthened his power also by vesting in himself and his successors the grand-mastership of the military orders of Calatrava, Alcantara, and Santiago. In all his schemes, F. was ably seconded by his queen Isabella, and by the celebrated Cardinal Ximenes. The year 1492 was the most brilliant in his reign, and is one of the most important in the history of the material progress of the world. It was signalized by the discovery of America by Christopher Columbus, though the honor of having aided the great navigator belongs not to F. but to Isabella. The same year witnessed the capture of Granada, and the retreat of the last Moorish monarch into Africa. F., who had a true Spanish hatred of heresy, immediately issued an order for the expulsion of the Jews from the conquered kingdom; and, in consequence, 160,000—some say 800,000—of his new subjects were compelled to scatter themselves over Europe. This act, neither wise nor Christian, was in accordance with the religious barbarism of the age, and especially of Spain. It was followed, several years afterward by the persecution and expulsion of the Moors—an act still more unwise than the former, for the Moors of Granada were unquestionably the most industrious, civilized, and refined inhabitants of the peninsula. F. was as successful abroad as at home. He was victorious over Alfonso V., King of Portugal; while his general, Gonzalvo de Cordova, twice wrested Naples from the French—the second time in 1503—after which it remained permanently in F.'s possession. In the following year, Isabella died; and in 1505, he married Germaine de Foix, niece of Louis XII. of France. He took part in the famous league of Cambrai against Venice 1508; made himself master of various towns and fortresses in Africa; and, 1512, conquered the kingdom of Navarre; thus becoming monarch of Spain from the Pyrenees to the Rock of Gibraltar. He died at Madrigalejo, and was succeeded by his grandson, Charles V. To F. and Isabella Spain owes her unity and greatness as a nation; and, in the no less skilful hands of their successor, she exercised an imperial influence over Europe, which it required Luther and the Reformation to check. See Prescott's *History of the Reign of Ferdinand and Isabella of Spain* (1838).

FER'DINAND VI. (The Sage), King of Spain: 1713–1759, Aug. 10 (reigned 1746–59; son of Philip V. and Louisa Maria of Savoy. He was proclaimed prince of the Asturias on the death of his elder brother Louis, 1725; was betrothed to Barbara, daughter of John V. of Portugal, 1729; and succeeded his father 1746, July 9. His main efforts after ascending the throne were to secure peace for his country, which had been exhausted by wars with England and Austria, and within a month he ordered the withdrawal of the Spanish troops from Italy, and began negotiations with England which resulted in the treaty of Aix-la-Chapelle and the restoration of peace to Europe 1748, Oct. He then gave great encouragement to manufactures, arts, and literature, improved the army and navy, reformed many abuses of ecclesiastical patronage, and, becoming weak in health and despondent in temperament, gradually relinquished the active control of state affairs to the queen, his ministers, and the tenor Farinelli (q.v.), whose singing had a remarkably soothing influence over him, and who thereby, became very powerful at court. At the outbreak of the seven years' war 1756 he maintained a strict neutrality, though offered Minorca by France and Gibraltar by England for his assistance. His queen died 1758, and he immediately fell into a deep melancholy which resulted in insanity and his death at Villaviciosa. As he left no issue, he was succeeded by his half-brother Charles III., according to the terms of the Aix-la-Chapelle treaty.

FER'DINAND VII., King of Spain: 1784, Oct. 14—1833, Sep. 29 (reigned 1814–33); son of Charles IV. and the princess Maria Louisa of Parma. Although he had the advantage of excellent preceptors, especially the Canon Escoiquiz, in his youth, yet the machinations of the notorious Godoy, minister of Spain, precluded his opportunifor the intelligent exercise of his faculties. A deliberate attempt was made by his mother and Godoy to degrade him into a lover of mere animal pleasures, that their influence and authority might be unrestrained. F. soon conceived an aversion to the minister, which was increased by his marriage in 1802 with the amiable and accomplished Maria Antonietta Theresa, daughter of Ferdinand I., King of the Two Sicilies. This lady, who endeavored to maintain her husband's dignity, died, 1806, May 21, of grief, as is supposed, at the insults offered to her by Godoy, the king himself, and above all by the queen. Suspicions of foul play, however, were entertained by Ferdinand. Mainly for the purpose of gratifying their hatred of Godoy, a number of the nobles, headed by the Duke of Infantado, assembled round F., the crown-prince. A false step that the latter now took proved the beginning of great misery to Spain. By the advice of the Canon Escoiquiz, he wrote a letter to Napoleon, in which he expressed a wish to marry the eldest daughter of Lucien Bonaparte. This letter fell into the hands of the minister himself, and the prince was in consequence arrested in the Escorial, 1807, Oct. 28, and declared a traitor by a royal proclamation, written in Godoy's own hand, and addressed to the Council of Castile. The animosity of the people toward the minister led to the revolution of Aranjuez, and the king abdicated in favor of F., 1808, Mar. 19. Almost immediately however, Charles wrote to Napoleon, declaring his abdication to be forced. Napoleon, who had designs of his own upon Spain, refused to recognize F. as king, but sent him an invitation to meet him at Bayonne. In spite of all warnings to the contrary, F. repaired to Bayonne, at which place he arrived Apr. 20, and was received with distinction by Napoleon. Meanwhile, however, the French troops under Murat had marched across the Pyrenees, and taken possession of the Spanish capital. The wretched squabbles and recriminations that followed between Charles and his son, and which were encouraged by Napoleon, ended in F.'s renouncing the crown of Spain unconditionally, receiving for himself and his posterity an annual income of 600,000 francs from the crown revenues of France, likewise the palace and parks of Navarre. The château of Valençay, belonging to Prince Talleyrand, was assigned as a residence, to him, with his brother Don Carlos, his uncle Don Antonio, the Canon Escoiquiz, and the Duke of San Carlos. Here his proceedings were watched with the utmost vigilance; and it was not till the end of 1813, when the splendid series of British triumphs in the peninsula had made a longer occupation of the country by the French impossible, that Napoleon offered to reinstate him on the throne of Spain. On Mar. 14 F. returned to Spain, where he was received with every demonstration of loyalty and affection. Very unfortunately for Spain and for his own comfort, F. had, in the meantime, learned to associate liberalism with Jacobinism, and both with Bonapartism, so that, on his reaccession to power, he threw himself into the hands of the clergy and the reactionary portion of his nobility. Even before his arrival in Madrid, he refused to swear or accede to the constitution of the cortes, as interfering too much with the free exercise of regal authority, though he promised another in its place. From the moment, however, that he assumed the reins of government, a series of transactions took place which excited the astonishment and disgust of all liberal-minded politicians in Europe. Instead of the promised constitution, there commenced a fearful system of persecution against all suspected of liberal opinions; and executions, imprisonment, exile, and confiscation of property reigned in all parts of the kingdom. The monastic orders, the Inquisition, and the rack were restored, and every expression of opinion rigorously repressed. It is estimated that 20,000 families were compelled to leave their country. At length, 1820, Jan., an insurrection broke out, and F. was compelled to restore the constitution of the cortes of 1812; but the French government interfering by force of arms, absolutism was restored in Spain 1823. In 1820, F. married the notorious Maria Christina—his *fourth* spouse. By the first three, he had no children. Maria, however, bore him two children: Isabella II., the late queen of Spain, and the Infanta Maria Louisa, who married the Duke of Montpensier. By the influence of Maria Christina, F. was induced to abrogate the Salique law excluding females from the throne, and to restore the old Castilian law of cognate succession. This step led to a dangerous combination among the adherents of the king's brother, Don Carlos, even during the lifetime of the former, and after his death, to a civil war: see DON CARLOS: ESPARTERO: ETC. 1833, June 20, the deputies, cortes, and grandees of the kingdom, took the oath of fealty, and did homage to the Princess of the Asturias, and F. died Sep, 29. F.'s reign was disastrous to his country. He has been described as the typical Spanish Bourbon—selfish, hypocritical, dissolute, ferocious, imbecile, and religiously savage.

FER'DINAND, *fėr'dĭ-nănd*, I. (EL GENTIL, The Gentleman), King of Portugal: 1345–1383, Oct. 22 (reigned 1367–83); son of Pedro I. of Portugal. He succeeded his father 1367, and two years later on the death of Pedro the Cruel of Castile, claimed the vacant throne as great-grandson of Sancho IV., on the maternal side. The kings of Aragon and Navarre also became claimants, and while the three disputed Henry of Trastamara boldly seized the crown and took the field at the head of the army. The rivals engaged in several indecisive campaigns, and then agreed to submit their respective claims to Pope Gregory XI. A treaty was ratified 1371 which provided for the marriage of F. and Leonora of Castile, but the former fell in love with the wife of one of his courtiers, Leonora Tellez, procured a dissolution of her marriage and made her his queen. This action led to an insurrection in Portugal and incited the Duke of Lancaster to prevail on F. to make a secret treaty for the expulsion of Henry from his throne. An unsuccessful war followed, and peace was negotiated 1373. Six years afterward Henry died, and the Duke of Lancaster reasserted his claims to the throne and was sustained by Portugal. F. signed a treaty of peace at Badajoz 1382, in which it was agreed that his heiress Beatrix should marry John, King of Castile, with the ultimate view of uniting the two crowns. He died at Lisbon without male issue, and the direct Burgundian line which had occupied the throne since about 1112 became extinct. After his death the agreements regarding the succession in the treaty of Badajoz were set aside and F.'s illegitimate brother, John, grandmaster of the order of Aviz, was proclaimed king. This defection led to a war of several years' duration.

FER'DINAND (Augustus Francis Anthony): titular King of Portugal (1837–53), regent (1853–55); b. 1816, Oct. 29; son of Prince F. of Saxe-Coburg-Gotha. He married the widowed Queen Maria II. of Portugal, 1836 and received the courtesy title of king 1837, Sep. 16. The queen died 1853, Nov. 15, and he became regent of the kingdom during the minority of their eldest son, the late Pedro V., which terminated 1855, Sep. 16. He is a man of wide scholarly and artistic attainments, an accomplished musician and composer, and a skilful painter and engraver. In 1869, June, he married Eliza Hensler, of Boston, Mass. (dau. of a German shoemaker formerly resident in Springfield, Mass.), a remarkably beautiful woman and a charming opera singer, for whom he obtained the title of Countess of Edla, and made his permanent home in Lisbon. He was offered the crown of Spain by marshals Prim and Serrano 1870, but declined it. F.'s second son, Louis I., succeeded to the throne 1861, Nov. 11; died 1889, Oct. 19; and was succeeded by his son, Carlos I.

FER'DINAND I., King of the Two Sicilies: 1751, Jan. 12—1825, Jan. 4 (reigned 1759–1825, with interregnum 1806–15); son of Charles III. of Spain. When Charles ascended the Spanish throne, 1759, F., though a minor, succeeded him on that of Naples under a regency. After his marriage, 1768, with Maria Carolina, daughter of Empress Maria Theresa, he fell completely under her influence, and lost all his former popularity. The queen and her favorite minister Acton (q.v.) ruled the kingdom. F. joined England and Austria against France 1793, but 1801 was forced to enter into a treaty with the First Consul. A subsequent violation of this treaty compelled him, 1806, to take refuge in Sicily, under the protection of the English. A French army marched into Naples, and took possession of the kingdom, which Napoleon bestowed first on his brother Joseph, and afterward on Murat. F. was reinstated by the congress of Vienna, and entered Naples, after Murat's flight, 1815, June. His queen had died 1814. During the revolution of 1820, he was obliged to introduce the Spanish constitution of 1812, but abolished it next year with the help of Austrian arms. He, however, expelled the Jesuits, and abolished superfluous convents; acts that may, perhaps, partly atone for his bloody persecution of the republicans 1800, and his general antipathy to enlightened principles of government. He was succeeded by his son Francis I., who died 1830.

FER'DINAND II., King of the Two Sicilies: 1810, Jan. 12—1859, May 22 (reigned 1830–59); son of Francis I. by his second wife, Isabella Maria of Spain. The country was in most wretched condition; and all eyes were turned to the young king, the beginning of whose reign was marked by various acts of clemency toward political enemies, and by the introduction of reforms in the economy and government of the country. But it was not long before he began to listen to foreign counsels, which saw danger for the whole peninsula in liberal measures. From that time, Naples became the scene of incessant conspiracy, insurrection, bloodshed, and political prosecutions. Ferdinand yielded to the storm of 1848, and granted a constitution to both parts of his dominions; he was even obliged to take part in the war against Austria in n. Italy. The Sicilians mistrusted, and with reason, the king's proceedings, and declared that he and his family had forfeited the Sicilian crown. F. followed the constitution so far as to call the chambers together, but quickly dismissed them, impatient of any interference with his authority. After the subjugation of Sicily 1849, when the reaction began to set in all over Italy, he hastened completely to set aside the new constitution; while all who had taken any part in state reforms were subjected to those cruel persecutions that the Letters of Mr. Gladstone have held up to the execration of the world. F. was succeeded by his son Francis II.

FER'DINAND III., Grand Duke of Tuscany, Archduke of Austria: 1769, May 6—1824, June 18 (ruled 1790–1824, with interregnum 1799–1814); b. Florence; son of Leopold II., whom he succeeded in the government of Tuscany, when Leopold obtained the imperial throne at the death of Emperor Joseph II., Leopold's brother. F.'s rule in Tuscany was one of combined mildness and ability; and during his reign were inaugurated many judicial, economical, and legislative reforms: commerce was protected and encouraged; hospitals and asylums founded, good roads opened through the state, and the greatest attention bestowed on the welfare of his subjects. A lover of peaceful progress, he remained strictly neutral in the first coalition against France, and was the first sovereign in Europe to recognize and treat diplomatically with the French Republic, 1792. In 1793, intimidated by the combined menaces of the Russian and British cabinets, F. was constrained to relinquish his neutral policy, and become a passive member of the coalition formed by the above governments against France. In 1795, on the French occupation of Piedmont, he speedily reassumed friendly relations with France. In 1797, to save his states from annexation to the Cisalpine Republic, F. concluded a treaty with Bonaparte on most unfavorable terms; undertaking to pay a war-levy to France, and to transfer to the Museum of Paris some of the chief master-pieces of the Florentine galleries, including the *Venus de' Medici*. Owing to the continued intrigues of France in his states, F. was forced to seek an Austrian alliance, which furnished Bonaparte with a pretext for declaring war simultaneously against Austria and Tuscany. In 1799, F. retired to Vienna, leaving the French troops in occupation of Tuscany. In 1801, at the place of Lunéville, he was forced to renounce all claim on Tuscany. In 1814, the peace of Paris reinstated him in Tuscany, and even restored his artistic treasures. This just and enlightened prince at his death left his states to his son Leopold III.

FERDINAND, Duke of Brunswick: 1721, Jan. 11—1792, July 3; fourth son of Duke Ferdinand Albert of B.: famous general. He received a thorough military education, entered the Prussian service at an early age, distinguished himself as col. in the first and second Silesian wars, and was given command of a division at the beginning of the seven years' war. Shortly after the memorable victory at Prague 1757, to which he contributed largely, George II. of England appointed him to the supreme command of the allied forces, with which he held both the imperial army and several subordinate French ones at bay for five years, notwithstanding his opponents were more numerous and better organized and officered than his own troops. During this period he gained a notable victory over the French under Marshal Contades at Minden, 1759, Aug. 1. An irreconcilable estrangement occurred between F. and Frederick the Great 1766, which resulted in the former retiring wholly from military service. He retired to his duchy, built the castle of Veschelde, and spent the remainder of his life in promoting educational and artistic enterprises, and in helping the poor.

FERETORY, n. *fĕr'ĕ-ter-ĭ* [L. *fĕrētrŭm*, a bier—from *fero*, I bear: It. *feretro*]: the bier or shrine containing the relics of saints, borne in processions; the place in a church where the bier is set.

FERGHANA, *fĕr-gâ'nâ:* Russian province of central Asia, formerly the khanate of Khokan (q.v.). F. is an anc. name of the city of Khokan, now the chief town of the province. F. is surrounded on three sides by the w. ranges of the Thian Shan Mountains, and its climate is generally healthful. One-third of the people are nomads. Pop. (1870) 900,0000.

FERGUS FALLS: a city and cap. of Otter Tail co., Minn., on the Red river of the North, and on the Northern Pacific and Great Northern railroads; 187 m. n. w. of St. Paul. It is situated in the heart of the park section of the State; is the seat of Norwegian Lutheran College; and has large woolen and flour mills. Pop. (1890) 3,772; (1900) 6,072.

FERGUSON, *fer'gŭ-son*, ADAM: Scottish philosopher and historian: 1724–1816, Feb. 22; b. Logierait, in Perthshire, Scotland, where his father was parish minister. He studied at the universities of St. Andrews and Edinburgh, and was appointed (1744) chaplain to the 42d regt., in which capacity he was in the battle of Fontenoy, and is said to have charged the enemy sword in hand, among the foremost of his regiment In 1757, he succeeded David Hume as keeper of the Advocates' Library in Edinburgh. He was appointed prof. in the Edinburgh Univ., first of natural philosophy 1759, and of moral philosophy 1764. In 1778–9 he acted as sec to the commission sent out by Lord North to try to arrange the disputes with the N. American colonies. The state of his health induced him, 1784, to resign his professorship, in which he was succeeded by Dugald Stewart. He died in St. Andrews. His chief works are—*Essay on the History of Civil Society* (Lond. 1767), *Institutes of Moral Philosophy* (Lond. 1769), *History of the Progress and Termination of the Roman Republic* (Lond. 1783), and *Principles of Moral and Political Science* (Lond. 1792) The work by which he is best known is his *History of the Roman Republic;* this, with the Essay and Institutes, have gone through a number of editions. All his works have been translated into German and French, and the Institutes has been used as a text-book in several universities.

FERGUSON, *fĕr'gŭ-son*, James: 1710–76; b. near Keith, a village in Banffshire, Scotland. His father being a poor day-laborer, he had only three months of instruction at school. His tastes were for practical mechanics and astronomy; and while keeping sheep, to which he was early sent, he was constantly employed in making models of mills, etc., and at night in studying the stars. After working at various country employments, he took to drawing patterns for ladies' dresses, and copying pictures and prints with pen and ink. He then supported himself and his parents by drawing portraits, first in Edinburgh, afterward (1743) in London; his leisure time being all the while given to astronomical pursuits. In 1748, he began lecturing with great acceptance on astronomy and mechanics. He was elected a fellow of the Royal Soc. 1763, and received from George III. a pension of £50. His principal works are—*Astronomy explained upon Sir Isaac Newton's Principles* (1756; Sir David Brewster's ed. 2 vols. 1811); and *Lectures on Mechanics, Hydrostatics, Pneumatics, and Optics* (1760; also edited by Brewster 1805). See his Life by Dr. E. Henderson, with Autobiography (2d ed. 1870).

FERGUSON, James: 1797, Aug. 31—1867, Sep. 26; b. Perthshire, Scotland: engineer and astronomer. He came to the United States 1800: studied civil engineering and surveying, and was employed as asst. engineer on the Erie canal 1817–19, asst. surveyor on the boundary commission under the treaty of Ghent, 1819–22, astronomical surveyor on the same commission 1822–27, civil engineer for the state of Penn. 1827–32, first asst. of the U. S. coast survey 1833–47, and asst. astronomer of the U. S. naval observatory 1847–67. He discovered the asteroids *Euphrosyne* (1854), *Virginia* (1857), and *Echo* (1860), for which he received the astronomical prize medals of the French Acad. of Sciences, 1854, 60.

FERGUSON, Samuel David, D.D.: Prot. Episc. bp. of W. Africa: b. Charleston, S. C., 1842, Jan. 1. When 6 years old he removed with his parents to the republic of Liberia, Africa, and was educated in the mission schools established there by the Prot. Episc. Church. He became a teacher 1862, deacon 1865, priest 1868, and missionary bp for W. Africa 1885. He was consecrated in New York 1885, June 24, and directly afterward returned to his station at Cape Palmas. For 20 years prior to his consecration, he had been an active promoter of the missionary and educational interests of his church.

FERGUSSON, *fĕr'gŭs-son*, James, D.C.L., F.R.S., LL.D.: 1808–1886, Jan. 9; b. Ayr, Scotland: architect, and eminent writer on architecture. He was educated in Edinburgh and London, spent several years in mercantile business in India, and then applied himself to studying the various styles of architecture in eastern countries. He published the results of his researches with many illustrations in *Illustrations of the Rockcut Temples of India* (1845); *Picturesque Illustration of Ancient Architecture in Hindostan* (1847); *Handbook of Architecture* (1855); *Essay on a Proposed New System of Fortification by Earthworks* (1849); *The Palaces of Nineveh and Persepolis Restored* (1851); *History of the Modern Styles of Architecture* (1862); *History of Ancient and Modern Architecture*, 3 vols. (1868), and *Temples of the Jews and the Other Buildings in the Haram Area at Jerusalem* (1878). He was architect of the Nineveh Court in the Crystal Palace at Sydenham, received the royal gold medal of the Royal Institute of British Architects 1871, Apr. 17, and was given the degree LL D. by the Univ. of Edinburgh 1878, Aug. His *History of Ancient and Modern Architecture* is one of the most complete and valuable works in that department.

FERGUSSON, Robert: Scottish poet: 1751, Oct. 17—1774, Oct. 16; b. Edinburgh. He received his education at the Univ. of St. Andrews, removed to Edinburgh, and was employed in the office of the commissary clerk. His poems were chiefly contributed to *Ruddiman's Weekly Magazine*, and gained considerable local reputation, which proved his ruin. His society was eagerly sought; and in that convivial time, he was led into excesses. He fell into a religious melancholy, and finally, through an accidental fracture of the skull, became totally deranged. His poems published 1773, show mastery over Lowland Scotch. To some extent the forerunner of Burns, who admired his works.

FERIAL, a. *fē-rĭ ăl* [L. *fĕrĭæ*, holidays, festivals]: pertaining to holidays. Feriæ, in anc. Rome, holidays during which political and legal transactions were suspended, and slaves enjoyed cessation from labor. Feriæ were thus *dies nefasti*, opposite of the *dies fasti*: see Fasti. Days consecrated to a particular divinity, on which any public ceremony was celebrated, and the like, were feriæ. In distinction from these which were *feriæ publicæ* (public holidays) there were *feriæ privatæ,* observed by single families, in commemoration of some important event in their annals. Birthdays, days of purification after a funeral, etc., also were observed as family feriæ. The public feriæ were divided into those always kept (*stativæ*) on certain days marked in the calendar; and those which were kept by command of the consuls or other superior magistrates on any public emergency. On all public feriæ the people generally visited the temples of the gods, and offered prayers and sacrifices. The most serious and solemn seem to have been the *feriæ imperativæ;* all the others were generally attended by rejoicings and feasting. See an elaborate article by Dr. Schmitz in Smith's *Dictionary of Greek and Roman Antiquities.*

FERID-EDDIN-ATHAR, *fĕh-rēd' ĕd-dēn' â-târ'* or Farid-Uddin Attar, 1119–1229; b. Kedken, Persia: poet and mystic His real name was Muhammed ben Ibrahhim, Ferid Eddin being an honorable title equivalent to 'Pearl of Religion.' He was a druggist or perfumer by trade. Early in life he became interested in the mystery of man's higher life, and abandoning his business. began studying the theosophy of the Sufis under Sheikh Rekenuddin. He entered into the spirit of that religion with so much earnestness, that he was before long recognized as one of its principal representatives, and after making the pilgrimage to Mecca was invested with the Sufi mantle by Sheikh Majduddin of Bagdad. He was a voluminous writer, and left about 120,000 couplets of poetry, doubtless written in early and middle life, as in his later years he carried his asceticism so far as to deny himself the pleasures of composition. His chief work was the *Mantic Uttair,* or language of birds, the text of which was published by Garcin de Tassy, the Orientalist, 1857.

FERINE, a. *fē'rīn* [L. *ferīnus*, pertaining to wild beasts —from *fĕră*, a wild beast] pertaining to, or like, a wild beast; savage. Ferity, n *-rĭ-tĭ*, cruelty; barbarity. Feral, a. *fē'răl*, wild; in a state of nature.

FERINGEE, n. *fĕr-ĭng'gē*, but properly Furungee, n. *fŭr-ŭng'gē*, or Farangi, n. *făr-ăng'gē* [Pers. *Farang*, Europe, comp. F. *franc*, free, a Frank]: in the *East*, a Frank; a European or white man: Adj. European; generally applied by natives to the Portuguese and other mixed races as an insulting name

FERIO, n. *fer'ĭ-ō* [a mnemonic word]: in *logic*, a mode in the first figure of syllogisms, in which the middle term is made the subject of the major and the predicate of the minor premise. It is composed of a universal negative, a particular affirmative, and a particular negative. Example: FER, No A is B. I, Some C is A. O, Some C is not B.

FERISO, n. *fĕr'ĭ-sō*, or Ferison, *fĕr'ĭ-son* [a mnemonic word]. in *logic*, a mode in the third figure of syllogisms, in which the middle term is the subject both of the major and the minor premises. Feriso differs from Felapton in that the minor premise is a particular instead of a universal affirmative.

FERLIE, or Ferly, n *fĕr'lĭ*, also Farlie, n. *făr'lĭ* [AS *faerlic*, sudden, fortuitous: Icel. *ferligr*, strange]: in *Scot.* and *prov. Eng.*, a wonder; a strange thing.

FERM, n. *fėrm* [AS. *feorm*, food, board, entertainment—from AS. *feorh;* Icel. *fjör*, life]: in *OE.*, a farm; rent for a farm; an abode; a dwelling.

FERMANAGH, *fėr-măn'a:* inland county in the s.w. of the province of Ulster, Ireland; 45 m. long, 29 broad; 714 sq. m., $\frac{3}{5}$ arable, $\frac{1}{76}$ in wood, and more than $\frac{1}{9}$ in water, including Upper and Lower Lough Erne, and the smaller lakes, Melvin and Macnean. The surface is mostly a succession of mountains and hills, and the scenery varies. The chief rocks are limestone, with many cavities and underground water-courses, millstone grit, and old red sandstone. Some coal, iron, and marble occur. The chief rivers are the Erne and its tributaries, the Colebrooke, Woodford, and Arney. The soil in the low grounds is a deep rich loam, but in the limestone and sandstone districts it is cold and thin. The climate is mild and moist. Marsh-fever prevails in summer and autumn near Lough Erne. In 1880, 104,622 acres were in crop; oats, barley, wheat, potatoes, turnips, and hay being the chief products. The chief exports are oats, butter, and eggs. F. is divided into 8 baronies and 23 parishes. It returns 2 members to parliament. Principal towns: Enniskillen, Lisnaskea, and Lowtherstown. A little coarse linen is manufactured in the county. In 1880 there were 16,844 pupils attending the national schools of F. The chief antiquities are raths or rude hill-forts, and some ecclesiastical ruins. Pop. (1851) 116,047; (1861) 105,372; (1871) 92,688; (1881) 84,879, of whom 47,228 were Rom. Catholics, 30.832 Episcopalians, and 1,672 Presbyterians; (1891) 74,037; (1901) 65,430.

FERMAT, *fĕr-mâ'*, PIERRE DE: 1590–1665; b. Toulouse: French mathematician. At an early period, with his friend Pascal, he hit upon a very ingenious mode of considering figurate numbers, upon which he subsequently based his doctrine of the calculation of probabilities. F. gave much study to the properties of numbers, and made many acute discoveries in regard to their composition and analysis. He also squared the parabola in a much simpler way than Archimedes had done, and made many other discoveries in geometry. His method of finding the greatest and least ordinates of curved lines was analogous to the method of the then unknown differential calculus. In addition to his scientific attainments, F. had extraordinary knowledge of ancient and modern languages. He died at Toulouse. A collection of his works appeared at Paris, 1679.

FERMATA, *fĕr-mâ'tâ*, in Music. pause or resting-point, generally marked by the sign 𝄐. The notes over which this sign is placed are prolonged beyond their true length. The F. is frequently found near the end of a part of a composition, which affords an opportunity for the singer or player to introduce an extempore embellishment.

FERMENT, v. *fėr-mĕnt′* [F. *ferment*—from L. *fermen′tum*, leaven—from *fervĕō*, I boil: It. *fermento*]: to cause to rise or swell by yeast, as dough; to cause to rise to froth by the addition of yeast; to effervesce; to produce a chemical change by some obscure agent which is not itself altered in the process—e.g., the change of sugar into alcohol, and alcohol into vinegar, by the alcoholic and acetic ferments respectively. Ferment, n. *fėr′mĕnt*, that which possesses the power of inducing fermentation—frequently a microscopic fungus; agitation; tumult; intestine motion. Ferment′ing, imp.: Adj. working; effervescing. Ferment′ed, pp.: Adj. having undergone the process of fermentation. Fermen′table, a. *-mĕn′tă-bl*, capable of being fermented. Fermen′tabil′ity, n. *-bĭl′ĭ-tĭ*. Fer′menta′tion, n. *-tā′shŭn* [F.—L.]: a working or frothing up of any substance under the influence of warmth, air, and moisture; an internal motion caused by decomposition; the process of converting the juice of the grape into wine, or the liquid extract of malt into an alcoholic liquor, as beer. Fermen′tative, a. *-tă tĭv*, tending to cause fermentation. Fermen′tativeness, n. Vinous fermentation, that fermentation in which sugar is converted into carbonic acid and alcohol. Ferment-oils, n. in *chem.*, volatile oils produced by the fermentation of various plants, not originally contained therein, and different from the oils which are extracted from the unfermented plants by distillation with water. They were known to the alchemists, and by them designated quintessences. Ferment-oils are for the most part more soluble in water than ordinary volatile oils. They are generally formed by allowing the flowering plant to ferment in water; the liquid is distilled when the fermentation is ended, and the oil extracted from the distillate by slaking it with ether, which dissolves the oil; the ether is then allowed to evaporate.

FERMENTA′TION: the change which occurs in one organic substance when influenced by another in a state of decay or putrefaction. The process was originally understood to include all the changes which matter of plant or animal origin undergoes when disunited from the living force, but is now restricted to certain of the changes. Thus, there are many substances, such as starch and sugar, which have no power of themselves to pass into decay, or change in composition through long periods of time; while there is another class of substances, including albumen, fibrine, and caseine, as well as gelatinous tissues, mucus, etc., which, when exposed to moderately heated air in a moist condition, more or less rapidly begin to putrefy or decompose. The latter substances, viz., those which spontaneously pass into a state of change, are called *ferments*, and when they are brought in contact with sugar, etc., which otherwise would not be altered, they cause the latter to be broken up into simpler compounds; it is this process that constitutes fermentation. The ferment is always a body which has the power of rotting, and is actually in a state of decomposition. Every substance which is liable to putrefy becomes, while putrefying, a ferment; and in this condition acquires the property of starting the process of F. in any second body capable of it, and retains the power till it is so far decomposed that the putrescence is past. The ferments are very widely distributed in organic matter; hence, whenever a plant or animal dies, the process of fermentation proceeds more or less rapidly. The most important kind of F. is that known under the designation of *vinous,* and which forms part of the processes in the preparation of alcohol, beer, wine, etc. It consists in the action of a peculiar ferment called yeast (q.v.) upon a saccharine liquid, when the sugar ($C_6H_{12}O_6$) is decomposed into two molecules of alcohol (each C_2H_6O), and two molecules of carbonic acid (each CO_2). In this change it will be observed that the yeast, while it causes the change, does not unite directly or indirectly with any of the constituents of the sugar. The vinous F. proceeds best at a temperature ranging from 60° to 80° F., the mean and more desirable being about 70° F. The process itself causes the development of heat, and recourse must be had, therefore, to large airy rooms, where the fermenting tuns or vessels are arranged, and also to the circulation of cold water in pipes distributed round the interior of the vessels, and in contact with the liquid. See BEER.

The *lactic acid* F. takes place in milk when it begins to sour. The caseine of the milk acts the part of the ferment, and it causes the change in the sugar of milk, which is in part resolved into lactic acid ($C_3H_6O_3$). The latter then curdles the caseine, and the milk becomes clotted. When the mik still further sours, and the material is kept at a temperature of 77° to 86° F., the *butyric acid* F. takes place, in which the putrefying caseine changes the sugar (q.v.) of milk into butyric acid ($C_4H_8O_2$).

The *viscous* or *mucus* F. occurs when the juice of the beetroot, dandelion, ash-tree, etc., is allowed to decompose at a temperature or 90° to 100° F., when the albuminous matter present causes the sugar to ferment into lactic acid, mannite, a gummy substance, some alcohol, and various gases. The same kind of F. occurs when boiled yeast or boiled gluten is added to ordinary sugar.

The remaining processes of F. are the *benzoic,* yielding, among other matters, the Essential Oil of Bitter Almonds (q.v.); the *sinapic,* which occurs in mustard when moistened with water, and during which the pungent oil of mustard is developed; and the *acetous,* which is, however, not a true instance of F., as the oxygen of the air is required to complete the change: see ACETIC ACID.

FERMENTED LIQUORS: alcoholic beverages made by fermentation of saccharine fluids and juices; the principal being the different kinds of *ale* or *beer,* made by fermentation of an infusion of malt, chiefly of barley, but sometimes of other kinds of grain; and *wine,* made by fermentation of grape-juice. *Cider* is made by fermentation of the juice of apples; *perry,* of that of pears; *palm-wine,* by fermentation of the sap of different kinds of palm. Fermented liquors, commonly called wines, are made also from the juice of various kinds of fruit, as currant wine from that of the red currant; and from the juice of some roots, etc. The sap of the American Aloe, or *Agave* (q.v.), yields the fermented liquor called *Pulque*, much used in Mexico. A wine is made from the sap of the birch, and that of some other trees is used for a similar purpose. *Mead* is a fermented liquor made from honey. From every fermented liquor, a kind of *spirit* may be obtained by distillation: see Beer: Spirit: Wine.

Statistics of Fermented and Distilled Liquors.—In Great Britain the quantity of wine entered for consumption (1802) was 5,449,710 gals., upon which duty of £1,723,339 was paid; (1851) 6,280,653 gals., paying duty of £1,776,246; (1880) total imports 17,385,496 gals., of which 15,852,382 were entered for home consumption; (1895) entered for home consumption 14,635,568 gals.; total value of wine imported (1895) £5,412,084, paying duty of £1,143,698. The world's wine product for 1893–4 was 3,432,150,000 gals. The consumption of beer in 1895 was 1,160,126,748 gals., valued at £87,009,506; (1896) 1,198,968,000 gals., giving for a population of 39,465,720 a per capita consumption of 30.13 gals. The manufacture of beer for 1883 was 27,141,466 barrels; (1893) 32,104,516 barrels; (1896) 33,826,354 barrels or 1,217,748,784 gals. The number of brewers has steadily decreased from 15,071 in 1883 to 9,664 in 1893 and 8,785 in 1896, owing to the concentration of the brewing industry in the hands of large capitalists, and accompanied by an increase of product and consumption, as shown by the figures given above for the same years. The world's production of malt liquors for 1894 was 5,477,862,221, the chief producing countries besides the United Kingdom being Germany, 1,466,129,420 gals.; North and South America, 1,323,563,026 gals.; Austria-Hungary, 484,938,000 gals.; Belgium, 252,856,814 gals.; France, 223,056,827 gallons; Russia, 122,080,090 gals.

IMPORTS OF SPIRITS AND WINES INTO THE UNITED STATES, 1824–1902.

Fiscal.	Value in $.	Fiscal.	Value in $.	Fiscal.	Value in $.
1824	3,193,518	1847	3,170,167	1870	7,587,676
1825	3,961,473	1848	3,095,238	1871	8,638,441
1826	3,368,900	1849	3,790,733	1872	8,582,228
1827	3,272,471	1850	5,372,063	1873	9,258,469
1828	3,839,189	1851	5,198,758	1874	8,636,469
1829	3,017,476	1852	4,644,053	1875	7,769,527
1830	2,194,092	1853	7,139,939	1876	6,594,551
1831	2,710,795	1854	6,872,565	1877	6,061.497
1832	3,752,497	1855	6,069,481	1878	5,517,427
1833	3,806,723	1856	9,655,400	1879	6,037,203
1834	4,263,633	1857	6,801,467	1880	7,736,532
1835	5,383,289	1858	5,478,840	1881	8,742,201
1836	6,249,415	1859	6,870,206	1882	9.849,533
1837	5,576,543	1860	8,712,817	1883	12,308.307
1838	3,795,200	1861	6,748,281	1884	8,951.723
1839	5,664.123	1862	2,511,141	1885	9,379,223
1840	3,801,740	1863	3,517,810	1886	10,036,287
1841	3,834,648	1864	4,758,117	1887	9, 11.553
1842	2,157,885	1865	2,406,408	1891	12,216,796
1843	575.541	1866	6,917,869	1892	11,894,998
1844	1,787,982	1867	5,756,998	1893	13,207,464
1845	2,091,306	1868	4,598,013	1894	9.149.608
1846	3,170,965	1869	6,272,491	1902	13,888,645

LIQUORS IMPORTED FOR CONSUMPTION IN YEAR ENDING 1902, JUNE 30.

ARTICLES.	Quantities.	Values.	Ordinary Duties.	Duty *Ad Val.*
MALT LIQUORS			$985,620	51.90
Ale, beer, porter, in bottles.....galls.	1,242,295	$1,203,128		
Do. not in bottles.....galls.	2,695,396	753,831		
DISTILLED SPIRITS			4,670,827	132.54
Brandy.....galls.	332,791	955,854		
All other.....galls.	1,959,755	2,909,337		
WINES			4,492,066	50.99
Champagne.....doz.	365,602	5,324,491		
Still wines, casks.....galls.	3,433,117	2,136,592		
Do. in other coverings.....doz.	410,058	1,955,728		
Total		$15,238,961	$10,148,513	71.30

MANUFACTURE OF LIQUOR IN THE UNITED STATES.

1870.						1900 (as reported in U. S. Census).					
CLASS.	Estab-lishm'ts.	Capital.	Hands.	Wages.	Value Products.	CLASS.	Estab-lishm'ts.	Capital.	Hands.	Wages.	Value Products.
		Millions.		*Millions.*	*Millions.*			*Millions.*		*Millions.*	*Millions.*
Distilled	719	15.5	5,131	2.0	36.1	Distilled	967	32.5	3,722	1.7	96.7
Malt	1,972	48.7	12,443	6.7	55.7	Malt	1,524	415	39,532	25.8	237.2
Vinous	398	2.3	1,486	0.2	2.2	Vinous	359	9.8	1,163	.44	6.5

ANNUAL CONSUMPTION OF FERMENTED LIQUORS IN THE UNITED STATES FOR TEN YEARS (1886–95).

Year ending June 30.	Amount Consumed.		Per Capita Consumption.		
	Wine.	Beer.	Wine.	Beer.	Total.
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*
1886	25,567,220	642,967,720	.45	11.20	12
1887	32,325,061	717,748,854	.55	11.23	13.99
1888	36,335,068	767,587,056	.61	12.80	14.67
1889	34,144,477	779,897,426	.56	12.72	14.60
1890	28.956,081	855,792,335	.46	13.67	15.53
1891	29,033,792	977,479,761	.45	15.28	17.16
1892	28,467.860	987,496,223	.44	15.10	17.04
1893	31,987,819	1,074,546,336	.48	16.08	18.04
1894	21,293,124	1,036,319,222	.31	15.18	16.82
1895	19,644,049	1,043,292,106	.28	14.95	16.35
Total..	287,755,451	8,883,127,039	.46	11.64	15.79

FERMO, *fĕr'mō:* town of Italy, province Ascoli Piceno, on a rocky height 4 m. from the Adriatic, 32 m. s.s.e. of Ancona. It is well-built and fortified, surrounded with walls and ditches, is the seat of an archbishop, and has a cathedral and a elegant theatre. Formerly A. possessed a university. It has some trade in corn and wool. In the immediate vicinity are the ruins of the ancient Firmum, whose name F. inherits. Firmum had been a Roman colony from B.C. 264. Pop. 15,682.

FERMOY, *fėr-moy':* town in the e. of Cork county, Ireland, chiefly on the right bank of the Blackwater, 19 m. n.e. of Cork city. Its origin dates from the 12th c., when it was the seat of a great Cistercian abbey; but its present importance dates from the end of last century. The hills of the town rise in Knockinskeagh 1,388 ft. F. is handsomely built and regularly laid out. A large ecclesiastical establishment (Rom. Cath.), consisting of a church, a bishop's house, two convents with large schools, and a college with nearly 100 students, has recently been erected on a hill rising from the Blackwater. A bridge of 13 arches, built 1689, crosses the river. Infantry and cavalry barracks for 3,000 men stand on the left bank of the river, and command the approach to Cork. F. has a trade in agricultural produce. Pop. (1871) 7,611; (1881) 6,454.

FERN, n. *fĕrn* [AS. *fearn*, fern: Sw. *fara*, to go—applied to events produced by diabolic art: AS. *fœr death*, sudden death]: a family of cryptogamic plants, usually with broad feathery leaves or fronds—probably so named from the reputed use of their seeds in magical incantations (see FERNS). FERNY, a. *fĕrn'ĭ*, abounding in ferns. FERNERY, n *fĕrn'ėr-ĭ*, a place where ferns are grown or cultivated. MALE FERN, name given, in consequence of an erroneous notion, long since exploded, to a fern very common in the woods of Britain and of the continent of Europe, the *Aspidium filix mas* of some botanists, and *Lastræa filix mas* and *Nephrodium filix mas* of other. The fronds are bipinnate; the pinnules oblong, obtuse, and serrated; the sori near the central nerve, orbicular, kidney-shaped, and fixed by the sinus; the stripes and rachis chaffy. It is a chief ornament of many forests, and a plant of considerable beauty. The subterranean stem (rhizome) is officinal. It is about 12 inches long, and of the thickness of a quill, almost inodorous, with a nauseous sweet taste, becoming astringent and bitter. It was anciently used as an anthelmintic, and its use has been revived, especially in cases of tapeworm, in which it is believed to be very efficacious. Its anthelmintic powers are due to a thick, almost black volatile oil which it contains, and which also is now used in medicine. SWEET FERN (*Comptonia asplenifolia*), shrub of the nat. ord. *Amentaceæ*, sub-order *Myriceæ*, native of the mountain-woods of N. America, forming a small bush with linear pinnatifid, fern-like leaves. Its leaves have a powerful aromatic fragrance when rubbed. It is tonic and astringent, and is used in the United States as a domestic remedy for diarrhea. FERN-SEED, n. the seeds or spores of ferns; these were formerly supposed to possess supernatural virtues, such as rendering a person invisible. *Note.*—Sheat gives the origin of *Fern*, Dut. *varen;* Ger. *farnkraut*, feather-plant: Skr. *parna*, a wing, a feather.

Common Male Fern.

FERN, FANNY: see PARTON, JAMES.

FERNANDEZ, *fĕr-năn'dĕz*, JUAN: Spanish navigator and discoverer. In 1563 he discovered the two islands which bear his name, and solicited the concession of them from the govt. on account of their beauty and fertility. His petition was granted 1572, and he planted a short-lived colony on the largest island. The adventures of Alexander Selkirk on this island are supposed to have formed the basis of De Foe's story, *Robinson Crusoe*. In 1574 F. discovered the islands of St. Felix and St. Ambrose, and his surviving companions affirmed that during a voyage in the s. ocean 1576, he came in sight of a continent which must have been either Australia or New Zealand if the discovery is to be taken as a fact.

FERNANDINA, *fėr-nân-dē'na:* city, cap. of Nassau Co., Fla.; on Amelia Island, bet. Nassau and Prince William Sounds, separated from the main land by a channel known as Amelia river; 28 m n.n.e. of Jacksonville, 36 m. s. of Brunswick, Ga.; n.e. terminus of the Atlantic Gulf and W. India Transit railroad. It is a port of entry and has a deep, commodious, and safe harbor, the entrance of which is marked by a light-house and Fort Clinch. The industries comprise the manufacture of lumber, sash, blinds, and cotton-seed oil, and foreign and coastwise trade in cotton and naval stores. It contains a court-house, 5 white and 4 colored churches, a Rom. Cath. acad., private bank, weekly newspaper; is the seat of the Prot. Episc. bp. of Fla.; and is a popular summer and winter resort with tri-weekly steamboat connection with Charleston and Savannah. Pop. (1870) 1,722; (1880) 2,562; (1900) 3,245.

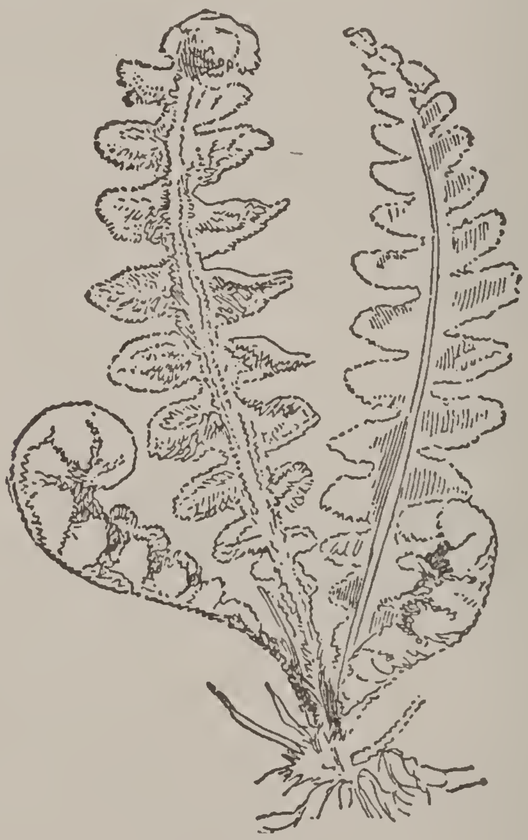
FERNANDO DE NORONHA, *fėr-nân'dō dā nō-rōn'ya:* lonely island of the Atlantic, about 125 m. from the coast of Brazil, to which it belongs. It is about eight m. in length. Pop. 2,000 (largely convicts).

FERNANDO PO, *fėr-nan'dō pō:* island on the w. coast of Africa, in the Bight of Biafra, about 20 m. from the nearest point on the shore; about 44 m. long, 20 m. broad. The appearance of this island from the sea is exceedingly picturesque and beautiful. It is traversed by a mountain-ridge, which, in Clarence Peak, rises to the height of 10,650 ft., and is fertile, well-watered, and in many parts thickly wooded. Besides swarms of monkeys, some of great size, the island contains many goats and sheep in a state of nature. The climate, always excessively hot, is rendered intolerable, during the rainy season, by a pestilential wind from the continent. The native population are of negro race, and are said to inhabit 15 villages. The English, with the consent of Spain, into whose hands F. P. had fallen, made an attempt 1827 to form a settlement on the island, but abandoned it 1834. In 1844, it was again taken possession of by Spain. The colony has a population of about 900, most of whom are liberated Africans. Pop. of the island (native), 10,000 to 12,000.

FERNAN-NUNEZ, *fĕr-nân'nôn'yĕth:* small town of Spain, province of Cordova, 10 m. s. of the town of Cordova. It has some linen and woolen manufactures. Pop, 5.500

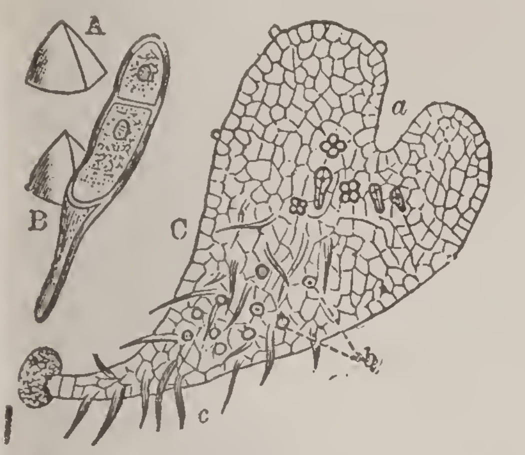
FERNOW, BERNHARD EDWARD: an American scientist; b. 1851, Jan. 7, in Inowraclaw, Germany; came to the United States in 1876, and engaged in metallurgical work; was chief of the Division of Forestry in the U. S. Department of Agriculture, 1886-98; and was made director and dean of the New York State College of Forestry at Cornell University in the latter year. He was author of numerous reports, bulletins and addresses.

FERNS (*Filices*): order of flowerless plants (see EXANNULATE), belonging to the sub-kingdom or series *Pteridophyta*, which includes also the *Equisetaceæ*, Horsetails, and the *Lycopodiaceæ*, Club-mosses. F. are either herbaceous perennial plants, or more rarely trees, the root-stock or the stem producing leaf-like *fronds* (often called leaves), which are sometimes simple, sometimes pinnated, or otherwise compound, have great variety of form, and are generally coiled up (*circinate*) in bud (see accompanying illustration). The fronds are traversed by veins, generally of uniform thickness, which are simple or forked, or netted, sometimes produced from the sides of a midrib or primary vein, sometimes from a primary vein on one side, sometimes radiating from the base of a frond or segment of a frond. The fructification takes place either on the lower surface or on the margin of the fronds, and arises from the veins. The spores are contained in capsules or spore-cases (*thecæ, sporangia*), which are often surrounded with an elastic ring, and are either naked or covered with a membrane (*involucre* or *indusium*), and are generally clustered in round or elongated or kidney-shaped masses (*sori*). The margin of the frond is sometimes folded so as to cover the spore-cases, and sometimes, as in the Flowering Fern (*Osmunda*) (q.v.), the fertile part of the frond is so transformed that its leaf-like character entirely disappears, and it becomes a spike or panicle. The spore-cases burst at their circumference, or irregularly, scattering the spores which germinate into the *prothallus*, a minute kidney-shaped cellular expansion with unicellular root hairs.

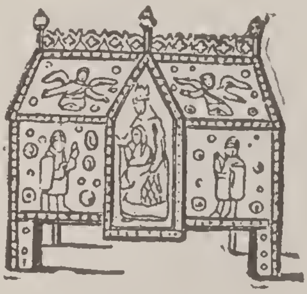


Ceterach Officinarum.

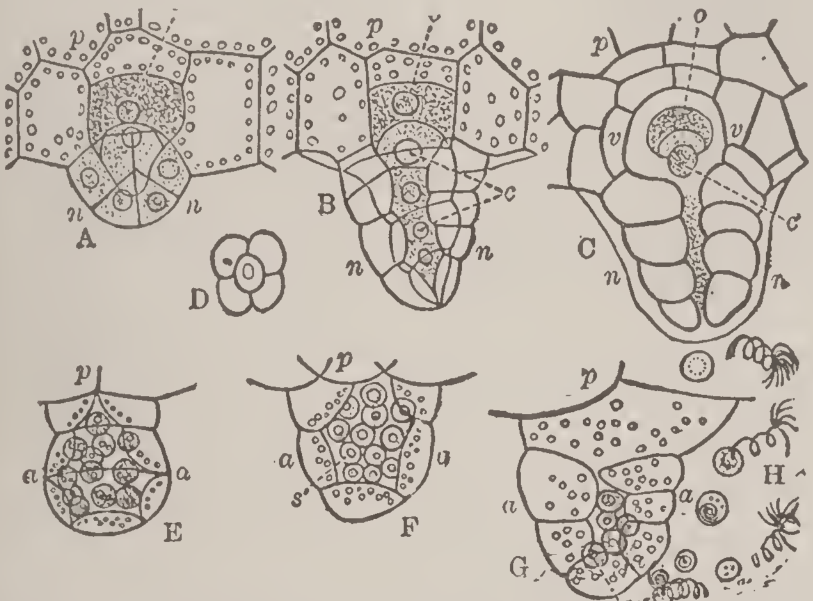
PLATE 15.



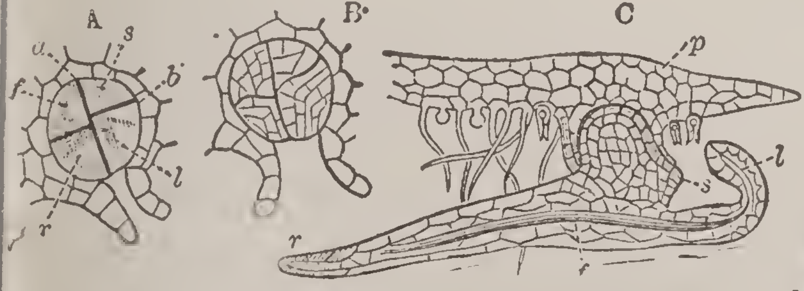
Ferns. — Germination of Prothallium: A, Spore; B, Germinating spore; C, Undersurface of prothallium, showing Archegonia, *a*; Antheridia, *b*; Rhizoids, *c*.

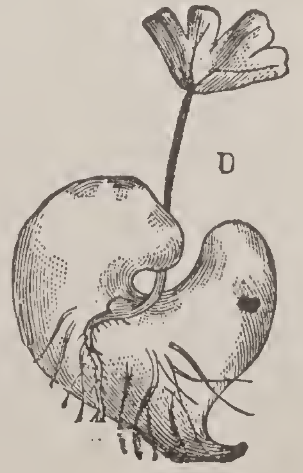


Feretory.



Ferns.—A-D, Archegonia; A-C, Longitudinal sections; D, Transverse section of neck; *p*, Prothallium; *n*, Neck of archegonium; *c*, Neck canal cells; *v*, Venter of archegonium; *c′*, Ventral canal cell; *o*, Oosphere. E-G, Antheridia in transverse section; *p*, Prothallium; *a*, Antheridium; *s*, Spermatocytes. H, Spermatozoids, *s′*, escaping from their vesicle, *v*, which contain starch grain.



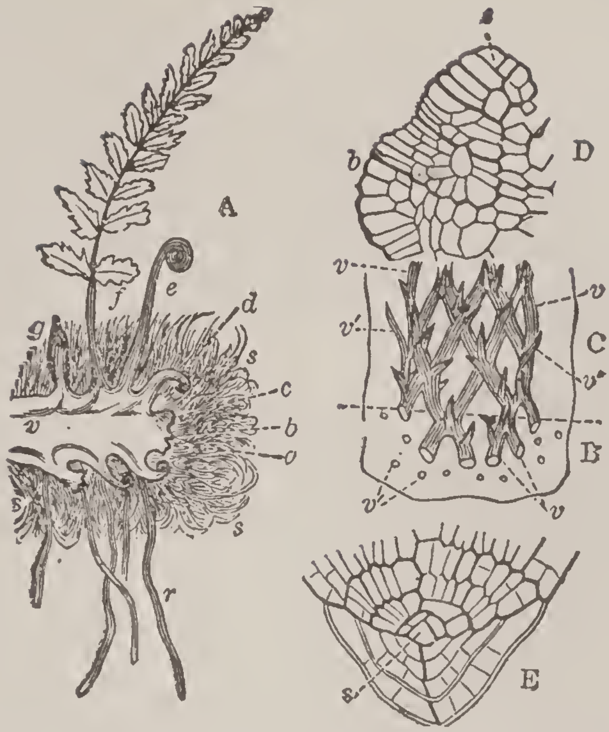


Ferns.—A, Fertilized oosphere, showing first *a*, and secondly *b*, division-walls, mapping out the inclination of growth of the Stem, *s*; Foot, *f*; Root, *r*; and First leaf *l*. B, Embryo at later stage. C, Vertical leaf-stalk through Prothallium, *p*; A young fern, *f*; First leaf, *l*; Stem, *s*; Root, *r*. D, Prothallium with young fern attached to it.

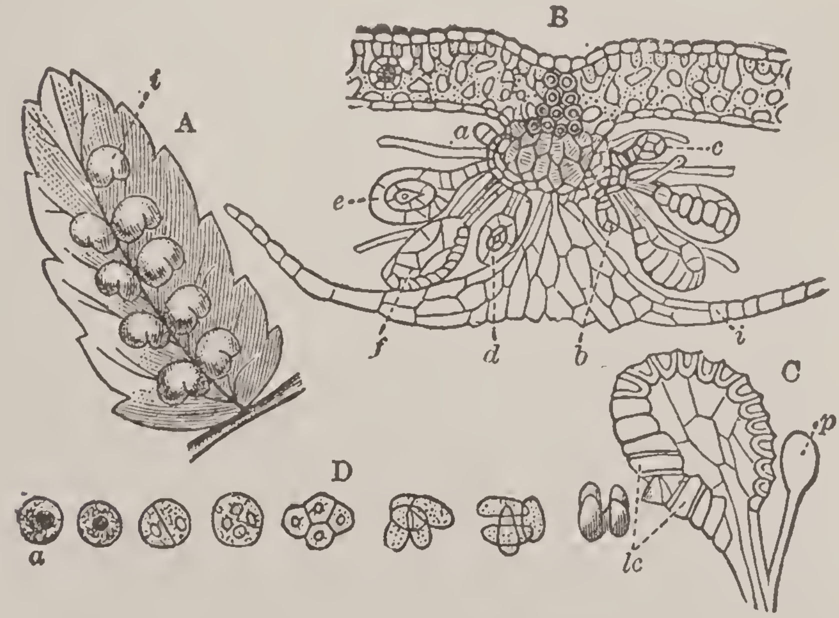
On the under surface of this, arise male and female reproductive organs, the *Antheridia* and *Archegonia*. The former develop ciliated spiral filaments, the 'antherozoids;' the latter, an oosphere from which, when fertilized, the 'fern' arises, an alternation of generations (see GENERATIONS, ALTERNATION OF) thus taking place.—The species of F. are about 2,500. They are found in all parts of the world but fewer toward the poles than within the tropics, and fewer in continental than in maritime countries, abounding exceedingly in mountainous tropical islands, as in Jamaica. Many of them delight in moisture and shade, though some are found in most exposed situations. Some resemble mosses in size and appearance; while Tree Ferns (q.v.) resemble palms, and sometimes attain a height of 40 ft. A few are climbers. One climbing species (*Lygodium palmatum*) is found in the United States as far n. as Boston. —F. are divided into *Polypodieæ, Hymenophylleæ, Gleicheniеæ, Schizææ, Osmundeæ, Danææ,* and *Ophioglosseæ,* of which sub-orders (or orders) the first contains a great majority of all ferns.—The root-stocks of some F. contain so much starch that they are used as food, or food is prepared from them, particularly those of the Tara (q.v.) Fern in New Zealand and Van Diemen's Land, and those of *Aspidium* (or *Nephrodium*) *esculentum* in Sikkim and Nepal; also the stems of some of the tree-ferns, as of *Cyathea medullaris* in New Zealand, and *Alsophila spinulosa* in India. The young and tender fronds of some F. are occasionally used as pot-herbs in the highlands of Scotland, Norway, the Himalaya, etc. The fronds are generally mucilaginous, slightly aromatic and astringent. Those of some species of Maidenhair (q.v.) are used for making *capillaire;* while the bitter and astringent root-stocks of some F. are occasionally used in medicine, as those of the Male Fern (see under FERN) and the Peruvian *Polypodium Caliguala,* particularly as anthelmintics). The fronds of a few species are delightfully fragrant.—The cultivation of F. is now in many places conducted, both in the open air and in hothouses; and to such an extent has the occupation of fern-collecting reached, that many excellent treatises on it have been written and elaborately illustrated: Among

Ferns:
Showing the Sori on the back of the Fronds.

PLATE 16.



Ferns.—A, Section along rhizome of Aspidium, showing vascular bundles *v*; stages of leaf development from apical buds to dead leaf-stalk, *a*-*g*; scale hairs, *s*; and roots, *r*. B, Transverse section of fern-rhizome, showing outside the smaller bundles, *v*′; passing out to the leaves and main bundles, *v*. The anastomosing of these, forming the netted cylinder, is shown in elevation in C. D, Tip of developing leaf of Ceratopteris: *s*, Apical cell; *b*, Lateral lobe of leaf. E, Longitudinal section of root-tip of Pteris: *s*, Apical cell, developing root-cap below.



Ferns.—A, Under-side of a leaflet of *Aspidium filix-mas*, with sori, *i*. B, Transverse section, with a sorus consisting of the sporangia in different stages of development, *a*-*f*, and the indusium, *i*. C, Sporangium, with annular lip-cells, *lc*, and paraphysis, *p*. D, Development of spores from mother-cell, *a*.

manuals, Gray's includes American F., with accompanying plates, illustrating genera. The magnificent nature-printed work, 2 vols. royal 8vo., by Henry Bradbury, supplies all needful information. Wardian cases, filled with F., have become common ornaments of apartments. For the principal species see their titles.

FEROCIOUS, a. *fĕ-rō′shŭs* [L. *fĕrox*, or *fĕrōcĕm*, fierce, cruel: It. and F. *féroce;* comp. Gael. *feargach*, angry]: savage; fierce; wild; ravenous. FERO CIOUSLY, ad. *-lĭ.* FERO′CIOUSNESS, n. or FEROC′ITY, n. *-rŏs′ĭ-tĭ* [F. *férocité*, fierceness—from L. *ferocĭtātem*]: savage wildness; inhuman cruelty.

FER OLIGISTE, *fĕr ŏl-ē-zhēst:* mineralogical term applied to a variety of anhydrous red oxide of iron (Fe_2O_3), otherwise called *Specular Iron Ore.* The famous Swedish, Russian, and Elba iron are in greater part prepared from this iron ore. The natural position of feroligiste is in the primary rocks. See IRON.

FERONIA, *fē′rō′nĭ-a:* in *Rom. myth.*, a goddess, commonly ranked among the rural divinities, and worshipped with great solemnity both by the Sabines and the Latins, especially by the former. In *astron.*, an asteroid, the 72d found. It was discovered by Peters, 1862, January 9. In *bot.*, a genus of Aurantiaceæ (citronworts), the order to which the orange belongs. The only known species is the wood-apple or elephant-apple (*Feronia elephantum*). It is a large and handsome tree of the East Indies.

FEROSH, n. *fĕr′ŏsh* [Hind. *furash*]: an Indian servant in charge of tents, furniture, etc. He is expected to sweep the ground and spread carpets.

FEROZABAD, *fē-rō-zâ-bâd′:* town of India, N.W. Provinces, 24 m. e. from Agra. It was formerly named Chandwar, and was of much greater importance than at present. Its fine edifices are mostly in ruins. Pop. 15,000.

FEROZE PORE, *fē-rōz-pôr′:* named from its founder, Feroze Toghluk (reigned in Delhi 1351–88); in the Punjab; about 3 m. from the left or s.e. bank of the Sutlej, lat. 30° 55′ n., and long. 74° 35′ e. Formerly a large and important town, as its massive fortifications and extensive ruins indicate, it had sunk into poverty and insignificance, before it came 1835 into the possession of the English. Since then, the place has regained much of its former consequence, holding out, with its wide streets and its colonnaded bazars, the promise of a great emporium of commerce. Politically, too, F. P. has become prominent under British supremacy, having been a starting-point, whether for war or for negotiation, in many British dealings with Afghanistan and the Punjab. In connection with this feature in its history, the city contains a monumental church in honor of the memory of those, both privates and officers, who fell in the various conflicts with the Sikhs. Pop. (1891) 50,437.

FEROZE PORE is the name also of a district, of 2,752 sq. m. It is now in part either barren or covered with jungle, but the ruins of towns and villages indicate that it must have been anciently both more fertile and more populous. Pop. about 650,000.

FEROZE SHAH, *fĕ-rōz-shâ':* village apparently within the dist. of Feroze Pore, about 10 m. e.s.e of the town of Feroze Pore; lat. 30° 52′ n., and long 74° 50′ e.; about 12 m. from the left bank of the Sutlej. It is noted as the scene of the second in order of the four great battles of the first Sikh war. The battle, which lasted two days, 1845, Dec., ended in the rout of the natives and the capture of their intrenchments. The British army was commanded by Sir Hugh Gough and Sir Henry Hardinge; and, as in the victory of Mudki, gained only three days before, it sustained heavy loss.

FEROZE SHAH CANAL: artificial water-course, for irrigation; of historical interest and economical value; length, including its branches, 240 m. It dates back as far as 1356, owing its origin and name, to Feroze Toghluk (reigned in Delhi 1351–88). Viewed as a whole, it leaves the right bank of the Jumna in lat. 30° 19′ n.; and, after sweeping round so as to skirt Sirhind, a territory on the Sutlej, it rejoins its parent stream at Delhi in lat. 28° 39′, thus measuring, in mere difference of latitude, 100 geographical miles. As is usual in the East, this important channel was so much neglected, that, in the beginning of the 17th c., it was cleared out by Vizier Ali Murdan Khan, who in fact was the first to carry it, through its lower half, back into the Jumna. Finally, the entire line has, in the 19th c., been again repaired and improved by the British government.

FERRANDINA, *fĕr-rân-dē'nâ:* town in the s. of Italy, province of Basilicata, on a height on the right bank of the Basento, 35 m. e.s.e. of Potenza. Good wine is produced in the neighborhood. Pop. about 8,000.

FERRANDINE, n. *fĕr'an-dīn:* a mixed stuff of silk and other materials. It probably resembled poplin: ADJ. made of ferrandine.

FERRARA, *fĕr-râ'râ:* most northern of the Italian provinces washed by the Adriatic; immediately s. of the Po, between the main branch of which, and the Po di Primaro, it is for the most part inclosed. As one of the old delegation, it had 1,180 sq. m., which area is now somewhat modified. The area consists mostly of swamp and lake; and many rivers and canals intersect it. Between the Po di Volano and the Po di Primaro, the marshes become very extensive, and receive the name of *Valli di Comaccio.* This province produces great quantities of fish, affords good pastures, and has great trade in corn and hemp. It was formerly a dukedom under the House of Este, but on the failure of a legitimate male heir, Pope Clement VIII. wrested it from this family, and annexed it to the States of the Church 1598. It became part of the kingdom of Italy 1860. Its pop., as one of the old delegations, was 244,524; but according to *Statistica Administrativa del Regno d'Italia* (1861) the province as modified had pop. 194,161; (1871) 215,369; (1901) 271,776.

FERRA'RA: ancient city of Italy, cap. of the province of F.; in a low marshy plain in the delta of the Po, about 4 m. s. of the main branch of that river, 28 m. n.n.e. of Bologna, 40 m. n.w. of Ravenna. F. was first made a walled city by the exarch of Ravenna about the close of the 6th c., and in the following century (661) became the seat of a bishop. In the middle ages, it was the great commercial emporium of Italy, and the seat of a court renowned throughout Europe; but now the city has a peculiarly deserted and melancholy appearance; grass grows on the pavements of its broad and regular streets, and its churches and palaces are either rapidly falling, or have already fallen into decay. It is surrounded with walls, and is strengthened by bastions and a fortress. The old castle, or ducal palace, once the residence of the Dukes of Este, but recently, until 1860, occupied by the papal legates, rises like a huge rock, is strengthened with corner-towers, and surrounded by a ditch. Its ecclesiastical edifices, which are very numerous, and of which the churches of Santa Maria degl' Angeli and of San Benedetto are the most remarkable in architecture, are rich in paintings by the great masters of the Ferrara and Bologna schools. Besides their valuable paintings, these churches contain numerous sculptured monuments of famous persons; the church of San Francesco has a curious echo, with 16 reverberations. The university, founded 1264, was reorganized 1402, closed 1794, and reopened 1824. It is in high repute as a school of medicine and jurisprudence, and is attended by 100 to 200 students. It has an excellent library, which, besides a variety of MSS., missal paintings, and old editions of printed works, contains several of the works of Tasso and Ariosto in their own hand. F. is remarkable specially for its art associations. Under the patronage of the Dukes of Este, it produced a school of painters who rank high in the history of art; while in literature the name of F. is immortalized through its connection with those of Tasso, Ariosto, and Guarini.

In 1849, the Austrians took possession of the town, but were compelled to abandon it at the commencement of the Italian campaign 1859, June. In 1860, Apr., F., with the state of which it is cap., was formally annexed to the kingdom of Italy under Victor Emmanuel.—At the period of its greatest prosperity, F. had about 100,000 inhabitants. Pop. of commune (1901) 87,648.

FERRA'RA, COUNCIL OF: 16th general council of the church according to Rom. Cath. authorities; convened by Eugenius IV. for the purpose of reuniting the e. and w. churches. The first session was held 1438, Jan. 10, with Nicholas Albergati presiding as cardinal legate; the second, Feb. 15, was opened by the pope in person. On Mar. 10, the Greek emperor John VI., the patriarch of Constantinople, and several eastern prelates were present, and the discussion of the doctrinal differences between the churches began the next day. The sessions were continued without any apparent results till 1439, Jan. 10, when in consequence of the outbreak of the plague the pope transferred the council to Florence, where the deliberations were prolonged till 1442, April 26. The C. of F. was a continuation of the Council of Basle, which was convened 1431: see FLORENCE, COUNCIL OF.

FERRARI, *fĕr-râ'rē*, GAUDENZIO: 1484–1549; b. Valdugia, in the Milanese; from a family which followed a career of art as if by inheritance. He was a scholar of Andrea Scotto and Perugino, and the chosen associate and friend of Raphael. His creations show genius of a bold, unshackled originality. The chief characteristics of F.'s style are correct and vigorous delineation, extreme vividness and delicacy of coloring, noble grace of form and attitude, and unsurpassable art in the classic disposal of drapery. Being one of the most laborious artists of his day, he executed innumerable paintings both in *fresco* and in oil, the greater part of which are in the Lombard galleries. His most comprehensive work, the frescos at Barallo. in Piedmont, represents the Passion; the *Martyrdom of St. Catherine,* to which he owes his brightest fame, is in the Milanese collection of paintings. Andrea Solario was the chief among his scholars.

FERRATE, n. *fĕr'rāt* [L. *ferrum*, iron (see FERREOUS)]: a salt formed of a base with the hypothetical ferric acid (FeO_3), or trioxide of iron (see IRON). FER'RIC, a. *-rĭk*, pertaining to or derived from iron. FERRIC OXIDE, peroxide or sesquioxide of iron, Fe_2O_3.

FERREIRA, *fĕr-rā'e-râ*, ANTONIO: 1528–69; b. Lisbon: classic poet of Portugal. He was educated at Coimbra, where he studied the Italian and Latin authors, especially Horace, whom he almost rivalled in conciseness, but not in elegance. After holding a professorship at Coimbra, he obtained a civil appointment at the court of Lisbon. He carried to perfection the elegiac and epistolary styles, already attempted with success by Sá de Miranda; and transplanted into Portuguese literature the epithalamium, the epigram, ode, and tragedy. His *Ines de Castro* is the second regular tragedy that appeared after the revival of letters in Europe, the first being the *Sophonisba* of Trissino. It is still regarded by the Portuguese as one of the finest monuments of their literature, for its sublime pathos and the perfection of its style. The works of F. are not numerous, as his official duties left him little leisure. His expression is strong rather than sweet, and is extremely animated. His efforts after brevity, however, frequently led him to sacrifice harmony to thought. His *Poemas Lusitanos* were published first at Lisbon, 1598, and the *Todas as obras de Ferreira*, 1771. Compare Sismondi's work, *La Littérature du Midi* (Paris 1813), and Bouterwek's *Geschichte der neuern Poesie und Beredsamkeit* (12 vols. Gött. 1801–19).

FERREL: see FERRULE.

FERREOUS, a. *fĕr'rĭ-ŭs*, or FERROUS, a. *fĕr'ŭs* [L. *ferrĕŭs*, pertaining to iron—from *ferrum*, iron]: pertaining to or consisting of iron. FERRICYANIDE, n. *fĕr'rĭ-sī'ăn-īd*, and FERROCYANIDE OF POTASH, *fĕr rō-sī'ăn-īd* [Gr. *kŭănŏs*, dark-blue]: salts called respectively the red and yellow prussiates of potash (see FERROCYANOGEN). FERRIFEROUS,

a. *fĕr-rĭf′ĕr-ŭs* [L. *fĕrō*, I bear]: containing or yielding iron. Ferro, *fĕr′rō*, a prefix denoting the presence of iron; Ferru′ginated, a. *-rô′jĭ-nā-tĕd* [L. *ferūgō*, or *ferrūgĭnĕm*, iron rust]: having the color or properties of iron-rust. Ferru′ginous, a. *-nŭs*, impregnated or coated with oxide of iron; chalybeate; rusty-looking. Ferruginous quartz, or *iron flint*, a variety of quartz forming the transition to jasper, and very hard. Ferruginous springs, n. in *geol.*, springs with much more than the normal amount of iron in their composition. They have a partly milky, partly ochreous hue, where the water stagnates, and cement the loose stones to which they have access. Ferruginous waters, natural waters containing iron: see Chalybeate Waters. Ferrugo, n. *fĕr-rô′gō*, a disease in plants, commonly called *rust*. Ferrous oxide, the rust of iron which is changed into the sesquioxide or red rust by the continual absorption of oxygen; the monoxide of iron. Ferriferous rocks, n. in *geol.*, rocks which contain iron ore, if they do not even mainly consist of it. The bands of clay ironstone of the Carboniferous age are of this character.

FERRET, n. *fĕr′rĕt* [OF. *fleuret*, floret-silk—from It. *fioretto*, a little flower—from *fiore*, a flower—from L. *florem*, a flower]: in *OE.*, spun silk, and ribbon woven from it; a kind of tape.

FERRET, n. *fĕr′rĕt:* in *glass manuf.*, an iron used to make the rings at the mouths of bottles, or to try the melted matter.

FERRET, n. *fĕr′rĕt* [It. *furuetto;* F. *furet;* Ger. *frette*, a ferret—from Prov. *fretar;* Bav. *fretten*, to move to and fro over a surface], (*Mustela furo*): animal of the weasel family (*Mustelidæ*) so nearly allied to the polecat (q.v.), that many regard it as a mere domesticated variety. It is of rather smaller size, the head and body about 14 inches long, the tail five inches and a half, the muzzle rather longer and more pointed, the head rather narrower; and the color is

Ferret (*Mustela furo*).

very different, being yellowish, with more or less of white in some parts, there being two kinds of hair, the longer partly white, the shorter yellow. The eyes are pink. It is much more susceptible of cold than the polecat, and requires careful protection in climates where the polecat is a hardy native. It was imported into Europe from Africa, and was well known to the Romans, being anciently employed, as it still is, in catching rabbits, for which purpose it is often sent into their burrows muzzled, or 'coped,' by means of a piece of string, to drive them out into nets, or, with a string attached to it, it is allowed to seize a rabbit in the burrows, and is then drawn out, holding it fast. The usual plan, however, is to let the F. have free range of rabbit-holes unmuzzled, the rabbits being shot as they bolt. The ferret is used in catching rats also. Attention to warmth and cleanliness is essential to the health of ferrets. They are capable of only partial domestication, acquiring a kind of familiarity with man, and submitting with quietness to his handling, but apparently never forming any very decided attachment; and they never cease to be dangerous if not carefully watched, especially where infants are within their reach. If allowed any measure of freedom, they are ready to attack poultry, and kill far more than they can devour, merely sucking the blood. They generally breed twice a year, each brood consisting of six or nine. The female sometimes devours the young ones, in which case another brood is speedily produced. To FERRET OUT, to drive out of a lurking-place; to find out or discover as a ferret does. FER'RETING, imp. FER'RETED, pp.

FERRIC, FERRICYANIDE, FERRIFEROUS, etc.: see under FERRATE and FERREOUS.

FERRIDCYANOGEN, *fĕr-rĭd-sī-ăn'ō-jĕn:* compound organic radical which has not been isolated, but which forms with potassium a well-known compound used in the arts, called the ferridcyanide of potassium or red prussiate of potash. In the preparation of this salt, a solution of ferrocyanide of potassium is acted on by a stream of chlorine gas until the color of the liquid passes from yellow to deep red, and thereafter, on evaporation and cooling, finered crystals are obtained. The chlorine (Cl) acts on two equivalents of the ferrocyanide of potassium (twice $K_4Fe\ C_2N_{12}$), removing two equivalents of potassium (F) froming oride of potassium (KCl), while the remaining constituents combine together, and produce one equivalent of ferridcyanide of potassium ($K_6Fe_2C_{12}N_{12}$). The latter is known commercially in red crystals, readily soluble in water, and yields a fine deep *Prussian blue* (Turnbull's blue) when mingled with solution of protosulphate of iron (green vitriol), and hence is used largely in dyeing and calico-printing.

FERRIER, *fĕr'rĭ-ėr,* JAMES F., LL.D.: metaphysician: 1808, Nov.—1864, June 11; b. Edinburgh; nephew of Susan Edmonston F. After studying at Oxford, where he took the degree B.A. 1832, he was admitted to the Scottish bar

1833. In 1842, he was elected to the chair of history in the Univ. of Edinburgh, and 1845 to that of moral philosophy in the Univ. of St. Andrews. He early attracted notice by some metaphysical essays in *Blackwood's Magazine;* and in 1854, he published *Institutes of Metaphysics*, in which he endeavors to construct a system of idealism in a series of propositions, demonstrated after the manner of Euclid. He afterward edited the collected works of his father-in-law, the late Prof. John Wilson of the Univ. of Edinburgh. F. died at St. Andrews.

FER'RIER, SUSAN EDMONSTON: novelist: 1782–1854; b. Edinburgh; aunt of James F. F. Her father, James F., one of the principal clerks of the court of session, colleague in that office of Sir Walter Scott, was intimate with the wits and literati of his day in Edinburgh, and Miss F. had the benefit of literary society. Her first work, *Marriage* (1818) was followed by *The Inheritance* (1824), and *Destiny* (1831). These tales are characterized by genial wit, a quick sense of the ludicrous, and considerable ability in the delineation of national peculiarities. Miss F. had the esteem and friendship of Sir Walter Scott.

FERRO, *fĕr'rō*, or HIERRO, *yĕr'rō:* most western of the Canary Isles; formerly considered the most westerly point of the old world, and for this reason geographers at one time took it as the point of departure in reckoning longitudes, as is still done by the Germans and some others. Hence, in all probability, originated the present hemispherical division of the maps of the world, F. being taken as the boundary-line. The English, however, have adopted the meridian of Greenwich as the first meridian and in this their example is followed by the Dutch, the Americans, and in sea-charts generally. The meridian of F. is 18° 9′ west of that of Greenwich: see LONGITUDE. F. has 82 sq. m.; pop. 4,400.

FERROCALCITE, *fĕr-rō kăl'sīt:* in *mineral.*, a variety of calcite containing carbonate of iron, and turning brown on exposure.

FERROCOBALTITE, n. *fĕr-rō-kō'bŏl-tīt:* in *mineral.*, a ferriferous variety of cobaltite.

FERROCYANOGEN, *fĕr-rō-sī-ăn'o-jĕn:* compound organic radical, generally regarded by chemists as existing in ferrocyanide of potassium, or the yellow-prussiate of potash, but which has not yet been obtained in a separate state. The principal compound of F. is the ferrocyanide of potassium, prepared by heating to redness in a covered iron pot a mixture of 3 parts by weight of nitrogenized matter, such as dried blood, hoofs, parings of hides, scrapings of horn, or the flesh of old or diseased horses and other animals, 3 parts of carbonate of potash, and one part of iron filings. The carbon, nitrogen, and iron combine together, and form ferrocyanogen ($FeC_6N_6 = FeCy_6$, or Cfy), which, at the same time, unites with the potassium, and produces ferrocyanide of potassium, or yellow prussiate of potash (K_4Fe, or K_4Cfy). The compound obtained from the heated F_6N iron vessel is impure, but by repeated solutions in hot water and recrystallization on cooling, the salt is obtained pure in fine large tabular crystals of a lemon-yellow color. The ferrocyanide of potassium is largely used in dyeing and calico (q.v.) printing in the production of many shades of *Prussian blue;* and when it is treated with sulphuric acid, and subjected to heat applied, hydrocyanic or prussic acid ($HCN = HCy$) distils off from the mixture. The ferrocyanide of potassium is characterised by giving no indication of the presence of iron in its radical on the application of any of the tests for iron. It gives a light-blue precipitate on the addition of a solution of proto-sulphate of iron; a dark blue precipitate with perchloride of iron; a ruddy brown precipitate with sulphate of copper; and a white precipitate with acetate of lead.

FERROL, *fĕr-rōl':* strongly fortified seaport town of Spain, in Gallicia: most advantageously situated on a narrow arm of the sea, 14 m. n.e. of the town of Corunna. It was originally a fishing-town, until selected for its natural advantages as a seaport by Charles III., who erected here what was at one time the finest naval arsenal in the world, and destined it exclusively for the Spanish royal navy. The entrance to the harbor, formed by a narrow inlet from the Bay of Betanzos, admits of the approach of only one ship-of-the-line at a time, and is defended by the castles of San Felipe and Palma. The town is defended by walls and fortifications; is, on the whole, regularly built, and has several squares and pleasing alamedas or public walks. The arsenal, in which 15 ships-of-the-line could be simultaneously built, covers a great space; and though now in somewhat ruinous condition, is still the most important in Spain. F. has manufactures of hats, naval stores, hardwares; and exports corn, brandy, vinegar, and fish. Pop. (including the garrison) (1900) 25,281.

FERROTYPE, *fĕr'rō-tīp:* term applied by Robert Hunt, the discoverer, to some photographic processes and results, in which salts of iron act an important part. Like many of the earlier paper processes, the ferrotype is far inferior in sensibility to the more modern collodion process or Archerotype, and is on that account seldom used.

FERRUGINOUS, FERRUGO, etc.: see under FERREOUS.

FERRULE, n. *fĕr'rûl,* or FERREL, n. *fĕr'rĕl* [F. *virole,* an iron ring—from mid. L. *vĭrĭŏlă,* a little circle of metal: L. *ferrum,* iron]: a ring of metal put about the end of a staff, etc., to keep it from splitting.

FERRUM, n. *fĕr'rŭm:* in *chem.,* a tetrad metallic element; symbol, Fe^{iv}; iron.

FERRY, v. *fĕr'rĭ* [Icel. *feria,* a passage-boat—from *fara,* to go; Ger. *fähre,* a ferry—from *fahren,* to go, to carry, allied to Lat. *fero,* I bear (see FARE 1)]: to carry or transport over water, as a river, a lake, etc.: N. the place or passage where boats are employed to carry over passengers. FER'RYING, imp. *-ĭng.* FER'RIED, pp. *-rĭd.* FERRY-BOAT, the boat in which passengers are conveyed over a ferry. FERRY-MAN, the boatman who attends a ferry. FERRY-

RAILWAY, n. a railway the track of which is laid on the bottom of the water-course, and whose carriage has an elevated deck which supports the train.

FERRY: passage by boat across water. Common rowing-boats are often used for ferrying foot-passengers, but for horses and vehicles, a flat-bottomed barge is generally used with an inclined plane at one end, or both ends to rest upon the shore, for landing and embarking. This is either rowed or pulled across by a rope. When the current is strong, and the river of moderate width, the rope is best. The rope stretched across the river passes through rings or over pulleys attached to the barge, and the ferrymen move the barge across by pulling the rope. With a small boat, in a strong current, the ferryman rows obliquely up-stream, and thus is carried directly across. Broad estuaries and streams between cities or populous towns are now traversed in many places by steam-ferry-boats, which are accommodated at the landings with bridges fastened to the shore at one end, while the other end rises or falls to correspond with the height of the boat's deck. On the Nile, a sort of raft is made of inverted earthen-pots full of air. Further, on crossing of rivers, see FORD—FORDING.

Flying-bridge is the name sometimes given to a kind of ferry-boat which is moved across a river by the action of the combined forces of the stream and the resistance of a long rope or chain made fast to a fixed buoy in the middle of the river. Such a transit appliance in the United States is known as a rope-ferry. The boat thus attached is made to take an oblique position by means of the rudder; the stream then acting against the side, tends to move it in a direction at right angles to its length, while the rope exerts a force in the direction toward the buoy. If these two forces be represented by the sides of a parallelogram, the actual course of the boat would be in the direction of the diagonal (see COMPOSITION AND RESOLUTION OF FORCES); but as the length of the rope remains the same, the boat must continue always at the same distance from the buoy, and therefore its course is a curve, a portion of a circle, of which the buoy is the centre, and the rope the radius. The course of the boat and the action of the two forces are strictly analogous to the path of a rising kite, and to the forces of which this path is the resultant. The holder of the kite corresponds to the buoy, the wind to the tidal stream, and the tail to the rudder. Flying-bridges are used for military purposes, and the modes of adapting them to the varying circumstances of the width of rivers and the velocity of their currents, form part of military engineering. An important element in the problem, is the determination of the right point of attachment for the rope. In the case of a wide river, the rope or chain requires to be of considerably length; and must be supported by movable buoys or by small boats.

In England a F., carrying passengers for pay, may be established upon a royal grant, or a prescription; but in the United States a statutory enactment of the state on whose waters the F. is proposed to be operated is essential. This authority may be exercised directly by the legislature or by a delegation of powers to courts, commissioners, or municipalities. Without such authority no one, though he may be the owner of both banks of the river, has the right to keep a public F. The franchise of a F. will, in preference, be given to the owner of the soil, but may be granted to another, and the soil of another may be condemned to the use of a F., upon just compensation, through the right of eminent domain. Such franchise is held to be an incorporeal hereditament, with descent to heirs, subjection to dower, and right of lease, sale, and assignment. A state has a right to establish a F. over a navigable river separating it from another state or even from a foreign territory, though its jurisdiction extends only to the middle of such a river; and it may also erect a new F. so near an older one as to destroy its value, unless the older franchise is protected by the terms of its grant; but an individual cannot do so without rendering himself liable to an action for damages, or a suit in equity for an injunction in favor of the first owner. The owners of a F., and tenants who may lease a F. of its owners, are common carriers in law, and liable for the safe transit of goods, persons, and animals, which they receive upon their boats. Their boats, drops, and flats must be safe and adequately guarded, for their responsibility begins the moment a person or animal comes fairly on the drop, and does not cease till after the drop at the other terminus is passed.

FERRY, *fā-rē*, JULES FRANÇOIS CAMILLE: 1832, Apr. 5—1893, Mar. 17; French statesman. He studied law, and was admitted to the bar in Paris, 1854, and connected himself with that group of young lawyers who maintained constant opposition to the empire. He became connected also with journalism, published a notable pamphlet, *La Lutte Electorale*, 1863, joined the staff of the *Temps*, 1865, and obtained wide notoriety by his attacks on Baron Hausmann's administration while rebuilding Paris 1868. In 1863 he made an unsuccessful attempt to secure election to the corps legislatif; but he was better known 1869 and succeeded. He opposed the declaration of war against Prussia, and demanded the dissolution of the corps legislatif on the ground that it no longer represented the majority in the country. At the revolution of 1870, Sep. 4, he was proclaimed a member of the govt. of the national defense; the next day he was appointe sec. to the govt., and the next was given charge of the administration of the dept. of the Seine. He repeatedly risked his life in efforts to suppress the Commune, was delegated to the central mayoralty of Paris 1870, Nov. 15, was elected a representative of the dept. of the Vosges 1871, Feb. 8, was prefect of the Seine, May—June, and minister to Greece 1872–3. In 1876, Feb. and 1877, Oct., he was elected to the chamber of deputies; 1879–80 was minister of public instruction and fine arts in Pres. Grévy's cabinet; 1880–81 was pres. of the council, and 1883–85 prime minister and minister of public instruction. During his tenure of the ministry of public instruction he created profound excitement through France by his efforts to exclude Jesuit teachers from the schools. See Education, *State Education in France.* The expenses and disasters of the Tonquin expedition rendered F. exceedingly unpopular and forced his retirement 1885. In 1890 he was again elected senator, and 1893, Feb. 24, was elected pres. of the senate. He was one of the few distinguished French politicians untouched by the Panama scandal.

FERRY, *fĕr'ĭ*, Thomas White: legislator: b. Mackinaw, Mich., 1827, June 1. He received a public-school education and engaged in the lumber business in Grand Haven. In 1850 he was elected to the state legislature, 1856 to the state senate; 1860 was vice-pres. for Mich. of the national republican convention; 1864–71, member of congress; 1871–83, U. S. senator; 1875, Nov. 22—1877, Mar. 4, acting vice-pres. of the United States; and 1883–86, travelled extensively in Europe and the East. He was elected pres. pro tem. of the U. S. senate several times, and presided over the impeachment trial of Gen. Belknap, sec. of war, and the joint electoral meetings of congress 1876–7. He d. 1896, Oct. 14.

FERSEN, *fĕr'zėn*, Axel, Count von: 1750–1810, June 20; soldier; b. Stockholm, Sweden. He entered the army of Sweden at an early age, was appointed col. of the Swedish body-guard of King Louis XVI. of France, and accompanied the French forces under Rochambeau to the U. S. After Cornwallis's surrender he received the insignia of the order of the Cincinnati from Washington, and returned to France, and endeavored to aid the royal family. Returning to Sweden he became chancellor of Upsala Univ., and grand marshal of the kingdom, and was murdered by a mob who charged him with complicity in the sudden death of Crown Prince Christian, which charge was afterward proved groundless.

FERTILE, a. *fėr'tīl* or *fėr'tĭl* [F. and It. *fertile*—from L. *fertĭlĕm*, fruitful—from *fĕrō*, I produce]: producing fruit in abundance; productive; fruitful. Fer'tilely, ad. *-lĭ*. Fertility, n. *fėr-tĭl'ĭ-tĭ*, fruitfulness; richness. Fertilize, v. *fėr'tĭl-īz*, to render productive or fruitful; to enrich. Fer'tilizing, imp.: Adj. enriching; rendering fertile. Fer'tilized, pp. *-īzd*, impregnated. Fer'tilizer, n. *-zėr*, that which enriches; a rich manure (see Guano: Manures: Phosphates). Fer'tiliza'tion, n. *-ī-zā'shŭn* [F.—L.]: the act of making fruitful. Fertilization of plants: see Fecundation.—Syn. of 'fertile': fruitful; abundant; productive; rich; inventive.

FERTILITY OF SOILS: see Soils.

FERTILIZERS: substances which increase the productiveness of soils and promote the growth of plants. The term is specifically used to designate the concentrated chemical F. which are articles of commerce while manure (q.v.), is used to indicate animal excrement, compost, and other fertilizing material obtained on the farm. While manures have been employed in agriculture from very early times the introduction of commercial F. is recent. The necessity for their use has arisen from the lessened fertility of the soil caused by the removal of many successive crops. The quantity of manure supplied by the farms has proved insufficient and diminished yields have attended the gradual impoverishment of the land. Commercial F. are designed to supplement rather than supplant farm-yard manures, and for this purpose they have proved invaluable. They allow the farmer to return to the land the elements of fertility which have been abstracted by continued cropping and at the same time supply an abundance of plant food in an immediately available condition. Their introduction has led to a much improved system of farming. Though bones, fish, and even superphosphate of lime had been previously employed to a very limited extent, the use of commercial F. may be said to date from 1840, in which year the first cargo of Peruvian guano was shipped to Europe. During the same year Liebig published his celebrated work on *Organic Chemistry* in which he pointed out the necessity of supplying to the soil the mineral constituents of plants which until then had been regarded as unimportant. Since that time the use of F containing mineral matters has come to be regarded as essential to the highest success in farming.

The principal elements of commercial F. are nitrogen, phosphoric acid, and potash. These elements are essential to the growth of plants and are likely to be deficient in soils which have been long under cultivation. Nitrogen (q.v.) for use in the manufacture of F. is obtained from sulphate of ammonia (one of the products of gas manufacture); nitrate of soda, vast deposits of which are found in Chili; dried blood and other refuse from slaughter-houses; fish guano (the refuse after the oil has been extracted from fish), and Peruvian guano (see GUANO) from islands on the coast of Peru. The two latter materials yield phosphoric acid and potash as well as nitrogen, and the slaughter-house refuse gives a small quantity of phosphoric acid. Bones; bone ash (bones from the great plains of S. America, burned in the open air); Canadian apatite; S. Car. phosphate rock, and Peruvian guano supply phosphoric acid (q.v.). Potash (q v.) is obtained from wood ashes and saltpetre, but principally from immense mines of potash salts near Stassfurt, Germany. Various grades of these salts are known as sulphate of potash, muriate of potash, and kainit. Complete F. contain nitrogen, phosphoric acid, and potash. Special F. also are manufactured which contain these elements in proportions varying according to the needs of the particular crops to which they are to be applied. The quantity to be used for farm crops ranges from 200 to 2,000 pounds per acre. It is applied either broadcast or in hills or drills. Used with manures or alone F. act promptly and certainly, give the plants an early and vigorous start, promote rapid development, hasten maturity, increase the yield, and in a marked degree improve the quality of the product. Vast quantities are used annually by farmers and market gardeners throughout the older settled portions of the country.

FERULE, n. *fĕr'ūl*, or **FERULA**, n. *fĕr'ū-lă* [L. *fĕrŭla;*

F. *férule*, a rod, a cane]: a rod or flat stick for inflicting punishment in a school.

FERULIC ACID, n. *fė-rôl'ĭk-* [L. *ferula*, derived from plants of the genus *Ferula*]: acid existing in asafetida, extracted by precipitating the alcoholic solution with lead acetate, and decomposing the precipitate with dilute sulphuric acid. There are other methods.

FERVENT, a. *fėr'vĕnt* [F. *fervent*—from L. *fervĕn'tĕm*, boiling hot, burning: It. *fervente*]: boiling; hot; earnest; ardent; vehement. Fer'vently, ad. *-lĭ*, eagerly; vehemently; with holy zeal. Ferventness, n. *-nĕs*, fervency; fervor; ardor; zeal. Fer'vency, n. *-vĕn-sĭ*, ardor; eagerness; warmth of devotion. Fer'vid, a. *-vĭd*, very hot; eager; zealous; glowing. Fer'vidly, ad. *-lĭ*. Fer'vidness, n. Fer'vor, n. *-vėr*, heat of mind; zeal; ardor; earnestness.

FESA, *fĕs â* or *fā'sâ*, or Fasa, *faw'sa:* town of Persia, province of Fars, 80 m. s.e. of Shiraz, in a mountain defile. It has manufactures of silken, woolen, and cotton fabrics, and some trade in a superior kind of tobacco grown in the vicinity. Pop. said to be 18,000.

FESAPO, n. *fē-sā'pō* [mnemonic word]: in *logic*, the fourth form of the fourth figure of syllogisms, in which the middle is the predicate of the major premise, and the subject of the minor consists of a universal negative, a universal affirmative, and a particular negative. Example: FE, No A is B. SA, All B is C. PO, Some C is not A.

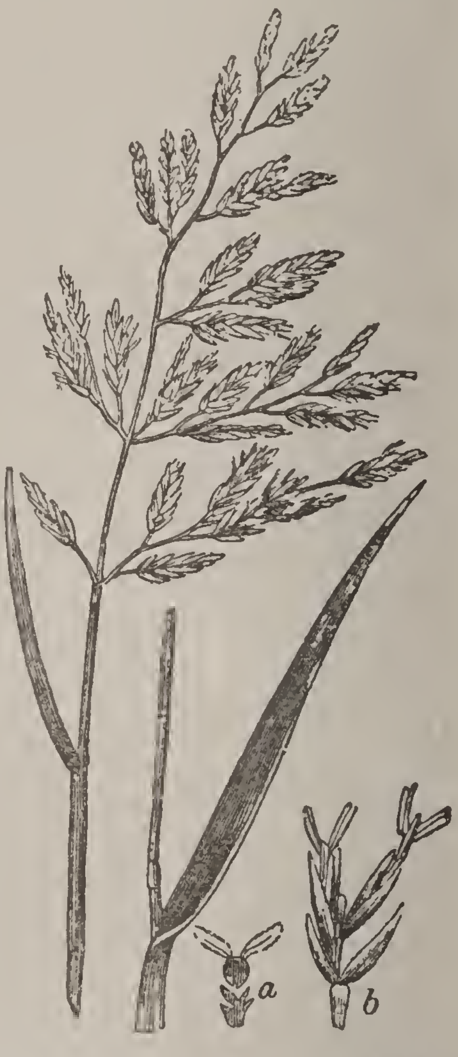
FESCENNINE, a. *fĕs'sėn-nīn* [from *Fescennium*, town of Etruria]: of or pertaining to Fescennium; licentious-lewd; obscene; scurrilous: N. a licentious, obscene, or scurrilous song, like the Fescennine verses (q.v.) of ancient Italy.

FESCENNINE VERSES, *fĕs'sĕn-nīn:* forming a department of the indigenous poetry of ancient Italy; a sort of dialogues in rude extempore verses, generally in Saturnian measure, in which the parties rallied and ridiculed one another. It formed a favorite amusement of the country-people on festive occasions, especially at the conclusion of harvest and at weddings. As was to be expected, it often degenerated into licentiousness, that at last required the curb of the law. The F. V. are usually considered of Etruscan origin, and to have derived their name from the Etrurian town Fescennium; but there is little probability in thi etymology. Verses of this sort were and still are popular all over Italy. The name is more likely connected with *fascinum*, fascination, enchantment, or the evil eye, against which the chanting of verses may have originally been intended as a protection.

FESCH, *fĕsh*, Joseph, Cardinal and Archbishop of Lyon: 1763, Jan 3—1839, May 13; b. Ajaccio. His father, a Swiss officer in the service of Genoa, had married a widow, whose daughter by a former husband, Letizia or Lætitia Ramolino, became the mother of Napoleon Bonaparte. F. was thus half-brother of Letizia, and uncle of the future emperor. He had entered the clerical profession, but left it at the outbreak of the French Revolution, and, 1795, became commissary to the Army of the Alps under his nephew in Italy. The First Consul having resolved on the restoration of the Rom. Cath. worship, F. resumed the clerical habit, and was active in bringing about the concordat with Pope Pius VII. 1801. He was 1802 raised to be abp. of Lyon, and in the following year to be cardinal. In 1804, he was sent as French ambassador to Rome, where he ingratiated himself with the pope by his adroit management and ultramontane sentiments, and contributed to induce the pope to undertake his mission to Paris to consecrate Napoleon as emperor. F. accompanied the pope, and assisted at the coronation; and for his services at Rome he was rewarded by the office of grand almoner and a seat in the senate. In 1806, the abp. of Regensburg, arch-chancellor and first prince elector of the just expiring German Empire, and about to become the prince primate of the nascent Confederation of the Rhine, chose F. his coadjutor and successor; and, with all these dignities, he received a stipend of 150,000 florins a year. In 1809, Napoleon wished to invest him with the Archbishopric of Paris, but F. declined it, as he had long been dissatisfied with the emperor's policy in regard to the papal chair. In 1810, he presided at a national conference of clergy assembled at Paris, and the views which he maintained there, with even more than usual keenness brought him into disgrace with the emperor, who was still further exasperated against him on account of a letter which F. wrote to the pope, then (1812) in captivity at Fontainbleau, and which was intercepted. He lost his imperial dignities and pension and after this lived in a sort of banishment at his bishopric of Lyon. At the approach of the Austrians 1814, he fled to Rome with his sister Letizia, mother of the emperor, where he was received with open arms by the pope. The return of Napoleon brought him back to France, and during the Hundred Days, he was nominated a member of the chamber of peers, though he never took his seat; but, after the battle of Waterloo, he had again to take refuge in Italy. The royalist clergy then persecuted him with accusations and lampoons which he in no way deserved. His resistance to the will of his nephew seems to have been actuated by zeal for what he considered to be the interests of the church. When called upon by the Bourbons to resign his episcopal office, he obstinately refused; and it was not till 1825, after receiving a papal brief interdicting the exercise of his clerical functions, that he resigned the charge but not the title. In 1837, an attempt was made to reinstate him, to which, however, the French government refused assent. He lived in the greatest friendship with his sister, Madame Mère as she was styled, till his death. Of his famous and very large collection of paintings, he bequeathed a part to the city of Lyon, and the rest was disposed of in a series of auctions at Rome after his death.

FESCUE, n. *fĕs'kū* [F. *fétu;* OF. *festu*, a straw: L. *festūcă*, a young shoot or stalk of a tree]: a small pointer; in *bot.*, a sharp-pointed coarse kind of grass.

FES'CUE (*Festuca*): genus of grasses of the ord. *Gramineæ*, very nearly allied to Brome-grass (q.v.), having in some species a loose, in some a contracted panicle; the spikelets many-flowered, with two unequal glumes, which they much exceed in length; each floret having two lanceolate paleæ, the outer paleæ rounded at the back, and acuminate or awned at the summit; the stigmas growing from the apex of the germen. The species are numerous, and very widely diffused over the world, in both the n. and the s. hemispheres. Among them are many of the most valuable pasture and fodder grasses.—Meadow F. (*F. pratensis*), a species with spreading panicle and linear spikelets, two to three ft. high, common in moist meadows and pastures of rich soil, in Britain and throughout Europe, in n. Asia, and in parts of N. America, is perhaps excelled by no meadow or pasture grass whatever. It is suitable both for alternate husbandry and for permanent pasture.—Spiked F. (*F. loliacea*)—by many botanists regarded as a variety of Meadow F., though it departs from the habit of the genus in having the branches of the panicle reduced to a single spikelet, and forming a two-rowed raceme or spike—is regarded as an excellent grass for rich moist meadows.—Hard F. (*F. duriuscula*), a grass 18 inches to two ft. high, with a somewhat contracted panicle, mostly on one side, is one of the best grasses for lawns and sheep pastures, particularly on dry or sandy soils. Several varieties are known to seedsmen and farmers.—Creeping F. or Red F. (*F. rubra*) is probably a mere variety of Hard F., distinguished chiefly by its extensively creeping roots which particularly adapt it to sandy pastures, and to places liable to inundations.—Sheep's F. (*F. ovina*) is a smaller grass than any of these, not generally exceeding 12 inches in height, and often much less, abundant in mountainous pastures, and especially suitable for such situations, in which it often is the principal food of sheep for many months of the year. It is common in all the mountainous parts of Europe, and in the Himalaya, it is also a native of North America, and species very similar, if not



Fescue Grass (*Festuca pratensis*): *a*, germen and stigmas; *b*, a spikelet.

mere varieties, abound in the s. hemisphere. Its habit of growth is much tufted. TALL F. (*F. elatior*) is a grass of very different appearance, four or five ft. high, with spreading much-branched panicle, growing chiefly near rivers and in moist low grounds, and yelding a great quantity of herbage, which, through coarse, is relished by cattle.—*F. heterophylla* is a tall species with narrow root-leaves, and broad leaves on the culm; native of France and other parts of the continent of Europe, and extensively cultivated in the Netherlands.—All these species are perennial.—Some small annual species occasionally form a considerable part of the pasture in dry sandy soils, but are never sown by the farmer. A Peruvian species (*F. quadridentata*), called *Pigouil* in its native country, and there used for thatch, is said to be poisonous to cattle.

FESELS, n. *fĕs'ĕls* [F. *faséoles*—from L. *phaselus;* Gr. *phasēlos*, a sort of kidney-bean]: in *bot.*, a kind of kidney-bean or French bean.

FESSE, or FESS, n. *fĕs* [L. *fascĭă*, a band: OF. *fesse*]: in *her.*, lines or a broad band crossing the shield horizontally, and containing the third part of it, between the honor point and the nombril. It is one of the honorable ordinaries, and is supposed to represent the waist-belt or girdle of honor, which was one of the insignia of knighthood. PARTY PER FESS, said of a shield, or charge in a shield, when it is horizontally divided through the middle, or, as the French say, *coupé*. FESSWISE, said of a charge placed *in* fess; that is to say, horizontally across the shield.

FESSENDEN, *fĕs'ĕn-dĕn*, WILLIAM PITT, LL.D.: statesman: 1806, Oct. 16—1869, Sep. 8; b. Boscawen, N. H.; son of Samuel F., LL.D., lawyer and maj.gen. of Mass. militia. He graduated at Bowdoin College 1823, was admitted to the bar 1827, began practicing in Bridgeton, Me., and settled permanently in Portland. In 1832 he was elected to the legislature as a whig, and became noted as a legislator and debater. He declined nominations to congress 1831 and 38, practiced law 1832–39, was returned to the legislature 1840 and served as chairman of the committee to revise the state statutes, was a member of congress 1841–43, was defeated for the U. S. senate 1843, was re-elected to the legislature 1845, 46, 53, and was elected U. S. senator as a whig by a democratic legislature in the latter year. He was appointed a member of the finance committee, and on his re-election 1859 became its chairman, and served as such through the war. On the resignation of Sec. Chase of the U. S. treasury dept., 1864, F. was appointed his successor, and held the office till 1865, Mar., when he resigned from ill health, and resumed his seat in the senate on a re-election. His greatest financial feat was the floating of the 7-30 bonds. He was a regent of the Smithsonian Institution, and received the degree LL.D. from Bowdoin College 1858 and Harvard Univ. 1864. As financier he was both judicious and brilliant; and his personal character commanded universal respect.

FESSLER, *fĕs'lĕr*, IGNAZ. AURELIUS: Hungarian historian: 1756–1839, Dec. 15; b. in the county of Soprony or Oedenburg. During a long life full of adventures, F. served successively Emperor Joseph II., the king of Prussia, and the emperor of Russia; and was prof. of oriental languages at different universities. He died at St. Petersburg. Among his works of lasting value are—*Attila* (Breslau 1794), *Mathias Corvinus* (2 vois. 1793; 2d ed. 1806 Breslau), and the History of the Hungarians, etc. (*Geschichte der Ungarn und deren Landsassen*, 10 vols, Leip. 1812–25). His autobiography, Recollections of my 70 Years' Pilgrimage (*Rückblicke auf meine 70 jährige Pilgerschaft*, Breslau 1826; 2d ed. Leip. 1851), is a very interesting work. Deep learning and rare beauty of style, render attractive F.'s works (all in German).

FESTAL, a. *fĕs'tăl* [L. *festīvŭs*, festive—from *festum*, a festival, see Fast; but according to some, fr. Gr. *hestia*, hearth]: pertaining to a feast; joyous; mirthful. Fes'tally, ad. *-lĭ*. Ees'tival, n. *-tĭ-văl* [F.—L.]: the time of feasting; an annual rejoicing; a holy-day, as church festivals: Adj. of or pertaining to a feast or day of rejoicing. Fes'tive, a. *-tĭv*, pertaining to a feast; joyous. Fes'tively, ad. *-lĭ*. Festivity, n. *fĕs-tĭv'ĭ-tĭ*, the mirth at a feast; gayety; social joy at an entertainment.—Syn. of 'festival': festivity; feast; banquet; carousal; celebration.

FESTER, v. *fĕs'tėr* [Walloon, *s'efister*, to corrupt: Low Ger. *fistrig*, fusty, ill-smelling: comp. Gael. *fiasdair*, angry, inflamed]: to corrupt; to rankle; to gather matter, as a sore; to suppurate: N. a sore which discharges corrupt matter. Fes'tering, imp.: Adj. rankling; growing more corrupt. Fes'tered, pp. *-tėrd*.

FESTINATE, a. *fĕs'tĭ-nāt* [L. *festinātŭs*, hastened, quickened]: in *OE.*, hasty; hurried. Fes'tinately, ad. *-lĭ*, with speed; hastily.

FESTINO, n. *fĕs-tī'nō* [mnemonic word]: in *logic*, the third form of the second figure in which the middle term is the predicate of both premises. It consists of a universal negative, a particular affirmative, and a particular negative. Example: FES, No A is B. TI, Some C is B. NO, Some C is not A.

FESTIVAL, FESTIVITY: see under Festal.

FES'TIVAL PLAYS: see Moralities: Miracle Plays Mysteries.

FESTIVALS, or Feasts: certain periodically recurring days and seasons set aside by a community for rest from the ordinary labor of life, and more or less hallowed by religious solemnities. Originating within the narrow circle of the family, and commemorating momentous events affecting one member or all, these pauses became more frequent, and of wider scope, as the house gradually expanded into a tribe, a people, a state. The real or imaginary founders, legislators, heroes, became objects of veneration and deification, and the salient epochs of their lives the consecrated epochs of the year. National calamities or triumphs were, in the absence of annals, remembered by corresponding general days of humiliation or exultation. Earliest of all, however, did the marked stages in the march of nature: spring and autumn, seed-time and harvest time—symbols of life and death; the solstice—turning-points of summer and winter; the new moon and the full moon; the termination of cycles of moons and cycles of years, present themselves as opportune halting-places for man himself. No less were the all-important periodical rises of fertilizing rivers, and the anniversaries of importations and inventions of new implements for the better cultivation of the soil, or tending of the flocks, befittingly celebrated. The inherent human tendency toward referring all things of graver import, life and death, abundance and want, victory and defeat, to a higher power, could not but infuse a religious feeling into epochs so marked. Fostered and guided by priests and lawgivers, this property of our nature erelong found its expression in common sacrifices, prayers, and ceremonies, consecrated to the various superior and minor deities who, it was thought, presided over and inhabited the elements of the visible and invisible creation, and who, working all the changes within them, acted each in its sphere, as a partial providence over man. According to the event which called them forth, these festivals were mournful or joyous, jubilant or expiatory. Even when sorrow was to be expressed, the mortification of the body did not always suffice, but plays, songs, dances, and processions full of boisterous mirth, were resorted to—as in the festivals of Isis at Busiris, of Mars at Papremis, in the Adonia of Egypt, Phœnicia, and Greece—because the divine wrath or sorrow was, like that of man, to be changed into satisfaction. Besides the relation between the common tutelary deity and those whom he protected, the bond also by which the otherwise disconnected members of the body-politic were held together was, by means of these festive gatherings, periodically brought in view, and invested with strength and importance. Apart, however, from this their historical, astronomical, religious, and political end, festivals served another purpose—that of growing civilization. It was the glowing spirit of emulation which, stimulating the gifted in mind and body to strive for the festive laurel in contests of genius and skill, in honor of the gods, and in the face of all the people, matured all that was noble and brilliant within the community. Archaic rudeness and rustic extravagance became refined grace and classic harmony. The stirring drama, the glorious anthem, the melodious dance, the elegant game, which accompanied the festive sacrifice of some nations at their highest stage of development, had arisen out of those very mimicries and shouts, rude and savage beyond expression, of generations not long preceding. Enthusiastic, wild, metaphysical Egypt invested the countless days consecrated to her deified stars, plants, animals, and ideas—to the Nile, to Ammon, Kneph, Menes, Osiris; to Horus, to Neitha, to Ptah—with a mystery; sensuality, and mournfulness always exaggerated, sometimes monstrous. The Hindu, no longer daring to offer human sacrifices, shows his odd and cruel materialism by throwing into the waves, on his festival of rivers, some of his costliest goods, gold, jewels, garments, and instruments; while in the licentiousness and debaucheries perpetrated on the festival of Shiva, the god of procreation, or on the Bacchantics of the goddess Bhavani, he exceeds even those of the Egyptians on their Neitha feasts at Bubastis, and the Greek worship of Venus in her Cyprian groves. Phœnicians and Assyrians, Babylonians and Phrygians, according to the little we know of their religions and manners, appear to have feasted, thanked, propitiated, mourned all at different times, and in the way most befitting their several natures, even in the case of those gods and festivals which they had in common.

The ancient Persians alone of all nations had no festivals, as they had no temples and no common worship. These 'Puritans of Polytheism,' who worshipped the sun only, and his representative on earth, fire, scorned show and pomp, and large religious gatherings. A striking contrast to them is formed, in another hemisphere, by the ancient Mexicans, who were found to possess one of the most richly developed calendars of festivals, scientifically divided into movable and immovable feasts. A strange and singular phenomenon among festivals, is that 'of the Dead or Souls,' celebrated among the wild tribes of N. America. At a certain time, all the graves are emptied, and the remains of the bodies buried since the last festival are taken out by the relatives, and thrown together into a large common mound, amid great rejoicings and solemnities, to which all the neighboring tribes are invited.

Greece had received the types of civilization, religion, and art from Egypt and the East generally, but she developed them all in a manner befitting her glorious clime and the joyous genius of her sons. At the time of the *Iliad*, two principal festivals only—the harvest and the vintage—seem to have been celebrated (ix. 250); but they increased with such rapidity, that in the days of Pericles they had reached, the number of a thousand; some indeed being an epitome only of their memorable feats of arms, others restricted to one town, or province, or profession, or sex, or to a few initiated, or recurring only at intervals of several years; but there were so many kept by the whole people, that ancient writers bitterly denounce them as merry beginnings of a sad end, as the slow but sure ruin of the commonwealth. Their forebodings proved true; yet Greece would certainly never have reached the highest place among nations, as far as literature, the arts, and philosophy are concerned, had it not been for the constant contests attached to her many festivals. She resisted Asia, because her citizens were always alert, always ready. The religious part of the festival—homage offered to personified ideas—consisted mostly in carrying about of the deity of the day to the sound of flute, lyre, and hymns, and in a sacrifice, followed by a general meal upon certain portions of the animal offered. Then followed scenic representations symbolizing the deeds of the gods; after which came games and matches of all kinds—foot, horse, and chariot races, leaping, boxing, throwing, wrestling, etc (For separate accounts of the more remarkable Greek festivals, see BACCHUS: ELEUSINIAN MYSTERIES: PANATHENÆA: ETC.) There were also special times set aside for the 'Holy Games' proper. The most important of these were the Olympian, the Pythian, the Nemean, and the Isthmian. (See these titles.) As all these festivities were provided out of the public purse—from the confiscated estates of the 'tyrants' and political delinquents—the individual did not suffer more than a welcome interruption of his usual business, and under that genial sky the penalty to be paid for occasional indolence was not too heavy.

Rome having been founded amid pastoral festivities in honor of some god Pales, adopted and acclimatized, as she went on from conquest to conquest, the foreign deities, exactly as, with her usual prudence and practical sense, she conferred her right of citizenship on her foreign inhabitants, and on the whole nations subjected to her rule. Her yoke was thus less galling to the new provinces, while the populace at home found sufficient distraction in the many ancient and newly imported festivals, with their quaint rites and gorgeous pageantry. Yet the Romans—more parsimonious and abstract by nature than the vivacious Greek neighbors from whom they had accepted the greatest part of their religion—never exceeded in their festivals the number of one hundred, and in these, again, a distinct line was drawn between civil and religious ones. Some of the principal religious festivals were the Sementinæ, Jan. 25—the rural festival of the seed-time; the Lupercalia, in honor of Pan; the Cerealia; the night festival of the Bona Dea; Matronalia; Minervalia; etc. To the purely civil ones belong the Janualia—Jan, 1, the new-year's day when the new consuls entered upon their office, and friends used to send presents (*strenæ*) to each other; the Quirinalia, in memory of Romulus, deified under the name of Quirinus; and the Saturnalia, in remembrance of the golden age of Saturn, beginning Dec. 19. The celebration of these festivals was in all respects imitated from the Greeks, with this difference only, that the games connected with them became, with the pre-eminently bellicose Romans, terribly lifelike images of war. Their sham sea-fights; their pitched battles between horse and foot, between wild beasts and men; their so-called Trojan games, executed by the flower of the nobility; their boxing-matches (with gloves that had lead and iron sewed into them): circus, arena, and amphitheatre gave, especially in later times, the greater satisfaction the greater the number of victims.

It is one thing only that monotheism has in common with polytheism with respect to its festivals—namely, that they are with each the religious expression of human joy or human sorrow or human hope. But polytheism, with a dim misgiving of some awful and supreme power, invited the multifarious governors of the many provinces of nature to partake, as guests, of bodily and intellectual feasts, *together* with their hosts; whereas monotheism, binding up all fear and all hope, all gratitude and all awe, which moved the heart of man, in one almighty Creator, Mover, and Maintainer of all things, celebrated its festivals in honor of this omnipresent Spirit with a veneration, a purity, and a lofty elevation, such as the worshippers of star, animal or image never knew. With the first and strictest monotheists, the Hebrews, whose very existence as a nation was traced to the special and miraculous interference of this only living God, the remembrance of that great event, their liberation from Egypt, and the momentous period of preparation in the desert which followed it, mingled with almost all their religious observances, and especially their festivals, and infused into them all a tone of gratitude; while it held ever before their eyes the cause of their nationality, and their aim and destiny 'to be a kingdom of priests and a holy people.' The Hebrew festivals, too, are of a historical, agricultural, astronomical, and political nature; but they mostly combine all these characteristics, and are always hallowed by the same religious idea, and the same piety and devotion to one and the same holy name. Connected with their festivals were no plays and no representations of a god's deeds, no games and no cruelty, no mystery and no sensuality, but the sacrifice of the day, and a special occupation with the divine law, were the visible signs of the exalted seasons. The influence of the number seven—an influence notable among most eastern nations—is seen in the recurrence of many of the Jewish solemnities: see SEVEN. The sabbath (q.v.), was first and most important of these septenary festivals, concerning the service in the temple, and the mode of observing this and the other festivals since the destruction of the temple, see HEBREWS JEWS. The most exalted of new-moon festivals was that of the first day of the seventh month, 'the day of remembrance of the sounding' or 'of trumpets' (Lev. xxiii. 24), to which in later times, when the Seleucidian era was introduced (the Syrian year beginning with the autumnal equinox), the name of Rosh hashana (New Year) was given; notwithstanding that in Ex. xii. 2, Nisan is spoken of as the first month of the year. After a period of six years of labor, the earth, too, was to celebrate a Sabbath-year; what it produced spontaneously belonged to the poor, the stranger, and to animals. It is remarkable that even Alexander the Great and Cæsar remitted the taxes of Judea in this year of *Shemitta* (abandoning). After a revolution of seven times seven years, the year of Jubilee or Jobel was to be celebrated. in which all the Hebrew slaves were set free, and all land which had been sold in the interval was restored to the former owners, in order that the original equilibrium in the families and tribes should be maintained intact. (These two epochs however, were, according to the Talmud, not kept, as festivals before the Babylonian captivity.) The pre-eminently agronomical and historical festivals were the three *Chaggim* (whence the Arab. *Hagg*, a pilgrim to Mecca)—viz., pesach (Passover), Schabuoth (Feast of Weeks), and Succoth (Feast of Tabernacles); on which three every man of proper age was obliged to go up to Jerusalem and offer some of the first fruits, besides the prescribed sacrifices (see PASSOVER: ETC. —For the postmosaic and exclusively historical festivals, Purim, the feast of Haman, Chanuca, the feast of the Maccabees, see JEWS.

The Christian festivals (see their several titles) were for the most part grafted, in the course of time, upon the Jewish and Pagan ones, but always with a distinct reference to Christ and other holy personages. The weekly day of rest was transferred from Saturday to the first day of the week, and called the day of joy, or Resurrection, as the weekly Jewish fasts of Monday and Thursday were changed for Wednesday and Friday: see FASTS. For a long time, both the Sabbath (Saturday) and the Lord's Day (Sunday) were celebrated, especially in the East. Two separate celebrations took the place of the Jewish Passover: the *Pascha Staurosimon* was the festival of the Death, the *Pascha Anastasimon* of the Resurrection of our Lord (see EASTER); and the festival of Pentecost, or the law-giving at Sinai, became the festival of the outpouring of the Holy Spirit and of the inauguration of the New Covenant and the Christian Church. In the 4th c., two new festivals were introduced: Epiphany (q.v.), which originated in the East; and the Nativity or Christmas (q.v.). Circumcision, Corpus Domini, the festivals of the Cross, of Transfiguration, of the Trinity, and many others, are of still later date. The veneration felt for the Virgin Mary as the Mother of our Lord found its expression likewise in the consecration of many days to her special service and worship; such as that of her Presentation, Annunciation (Lady's Day) Assumption, Visitation, Immaculate Conception (q.v.), and many minor festivals, besides the Saturdays, which in some parts were entirely dedicated to her, in order that the Mother might have her weekly day like the Son. Besides these, there were festivals of Angels, of Apostles, Saints, Martyrs (on the supposed anniversary of their death, called their birthday, *dies natalis*), of Souls, Ordinations, etc.

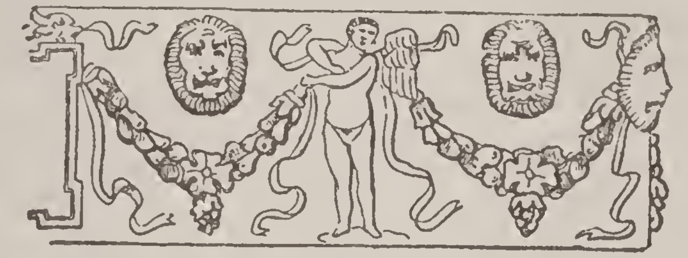
Celebrated at first with all the primitive simplicity of genuine piety, most of these festivals were ere long invested with such pomp and splendor that they surpassed those of the ancient Greeks and Romans. Burlesque, even coarse and profane representations, processions, mysteries, and night-services, were, in some places, though unauthorized by the general church, connected with them, and voices within the church loudly denounced these 'pagan practices.' Ordinances forbidding mundane music and female singers for divine service were issued, the vigils were transformed into fasts, days of abstinence and penance were instituted, partly as counterpoises, but with little result. Nor did the prodigious increase of these festive occasions, and the rigor with which abstinence from labor was enforced in most cases, fail to produce the natural results of indolence and licentiousness among the large mass of the people. Bitter and frequent were the complaints throughout Christendom; but though even men like Abp. Simon of Canterbury (1332), Petrus de Alliaco, Nicolaus of Clemangis, did their utmost to obtain a reduction of these festive occasions, which overspread well-nigh the whole year, it was only after the most decided and threatening demands, such as that pronounced by the German Diet of Nürnberg 1522, that Pope Urban was prevailed upon reduce the number for Rom. Cath. Christianity (1642). Benedict XIV. (1742), Clement XIV. (1773), followed in the same direction. The reformation wrought a change both in their number and in the manner of their celebration.

The Christian festivals have been divided variously: into *feriæ statutæ* (returning annually at fixed times), *indictæ* (extraordinary, specially proclaimed), *duplicia* (double reminiscence, or of higher importance), *semiduplicia* (half double), etc. Another division is into weekly and yearly feasts, these latter being subdivided into greater and minor, or into movable and immovable. There is also a distinction made between *integri* (whole days), *intercisi* (half-days), etc. Beside the church festivals, there are also in some countries, civil days of annual religious observance (Thanksgiving Day, Fast Day), commended to all the people by proclamation from the civil power. The only trace of the ancient manner of dating a festival from the eve or vesper of the previous day—a practice discontinued since the 12th c., when the old Roman way of counting the day from midnight to midnight was reintroduced—survives in some regions in the 'ringing in' of certain days of special solemnity on the night before, and in the fasts of the vigils.

On some of the principal Mohammedan festivals, based partly on those of the Jews and Christians, such as the weekly Friday, the Yom Ashoora (Jewish Day of Atonement), the Birthday of the Prophet (Molid An-Nebee), that of Hussein, of Mohammed's granddaughter Zeyneb, of the Night of the Prophet's Ascension to Heaven (Leylet Al-Mearag), the Night of the Middle of the Month Shaabán, in which the fate of every man is confirmed for the ensuing year; the Eed Al-Shagheer or Ramadan-Beyram, at the end of the Ramadan fasts, and the Eed Al-Kabir, or the great festival of the Sacrifice (Kurban Beyram), see Mohammedanism. For further information, see Herodotus (ii. 60); Plutarch (vii.); Strabo (vi. and x.); Ovid, *Fasti;* Macrobius, *Sat.* i. 7, 11; Meursius, *Græcia Feriata;* Meiners, *Geschichte d. Relig.;* Fasold, *Ierologia;* Bible; Mishna; Gemara; Shulchan Aruch; Josephus; Philo; Maimonides; Buxtorf. *Lex. Talm.; Synag. Jud.;*

Bartolocci, *Bibl. Rabb.;* Lightfoot, *Hor. Hebr. and Talm.;* Lund, *Bibl. Hebr.;* Wette, *Archæologie;* Neander, *Hist. of the Ch.;* Blackmore, *Christ. Antiq.;* Baumgarten, *Erläuterung d. chr. Alterth.;* Siegel, *Handb. d. chr. Alterth.;* Mai, *Discorsi di Argomento Religioso;* Koran, etc.

FESTOON, n. *fĕs-tôn'* [F. *feston*—from It. *festone*, a garland—from mid. L. *festōnem:* probably connected with mid. L. *festis;* OF. *fest* and *faiste;* F. *faîte*, a top, a ridge]: a chain or string of a number of things hanging downwards in a curved form between two points, as flowers or fruits: in *architecture*, an ornament in the form of a wreath of flowers, leaves, or fruit, frequent in Roman and renaissance buildings. Like many of the other ornaments of classic architecture, it owes its origin to one of the sacrificial emblems, viz., the flowers with which the heads of the animals, the altars, etc., used to be decorated. The festoon occurs with bulls' heads on the frieze of the temple of Vesta at Tivoli. The fig. is an example of a renaissance festoon, from the library of St. Mark at Venice. FESTOON, v. to adorn with festoons. FESTOON'ING, imp. FESTOONED', pp. *-tônd':* ADJ. made into festoons or adorned with them.


Festoon:
St. Mark's Library, Venice.

FESTUCEÆ, n. *fĕs-tū'sē-ē* [L. *festuca*]: in *bot.*, tribe of grasses containing two families, *Bromidæ* and *Bambusidæ*, the type of which is Festuca or Fescue-grass: see FESCUE.

FESTUS, *fĕs'tŭs*, SEXTUS POMPEIUS: Latin lexicographer, of the 3d or 4th c.; is one of the most important ancient authorities on the Latin language. He made an epitome of the great work of Verrius Flaccus, *De Verborum Significatione.* This compilation, arranged alphabetically in 20 books, was further abridged and spoiled in the end of the 8th c. by Paul, son of Warnefried, commonly called Paulus Diaconus. The great work of Flaccus has unfortunately entirely perished, and of the abridgment made by Festus, only a single MS., and that deplorably imperfect, has survived. It was brought from Illyria, and fell into the hands of Pomponius Lætus, a distinguished scholar of the 15th c. It ultimately passed into the library of Cardinal Farnese, at Parma, and is now preserved at Naples. The work, in spite of all its imperfections, is a grand storehouse of knowledge on points of mythology, grammar, and antiquities. All previous editions of F. are of little value compared with that of K. O. Müller (Gött. 1839), in which he has made use of the Farnese MS. and other sources, distinguishing the value of each.

FET, v. *fĕt* [AS. *fetian*, to fetch, to bring to: Sw. *fatta*, to seize]: in *OE.*, to fetch. Fet, pp. fetched.

FETAL, a. *fē'tăl*, FETATION: see under Fœtus.

FETCH, v. *fĕch* [AS. *fetigean;* Fris. *fetje;* Sw. *fatta;* Ger. *fassen*, to seize: Bav. *fessen*, to bring home]: to go and bring; to heave, as a sigh; to bring, as its price; to reach; in *OE.*, to effect or perform. Fetch'ing, imp. reaching. Fetched, pp. *fĕcht.* To fetch up, to carry up; to take forward; to make up lost time. To fetch out, to develop; to cause to come or appear. To fetch a compass, to make a circuit in order to reach.—Syn. of 'fetch': to bring; bear; carry; convey; transport; get; perform; attain.

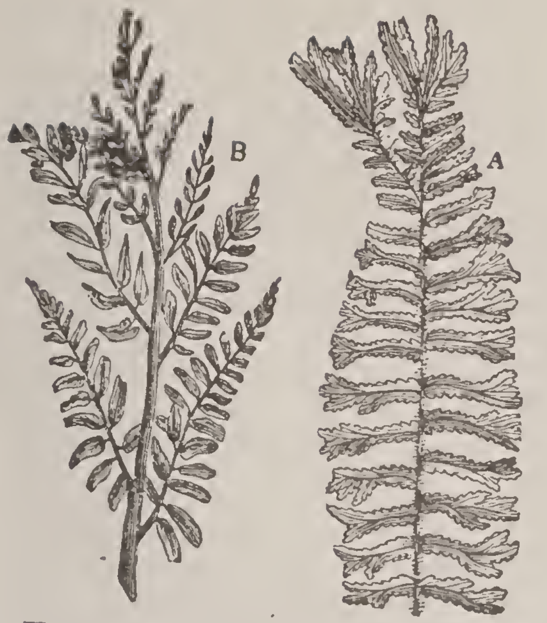
FETCH, n. *fĕch* [Ger. *fatzen*, tricks: Bav. *fatzen*, to play tricks, to jest]: in *OE.*, a trick; the pretense to do one thing while another is intended; a stratagem.

FETCH, n. *fĕch*, or Fetch-candle [in Scand. myth. *Vætt*, a kind of goblin; *Vætt-lys*, the Vætt's candle]: the apparition of one who is alive; a nocturnal light as of a moving candle; the ignis-fatuus or Will-o'-the-wisp. Fetch, lights, the appearance at night as of a lighted candle-supposed to prognosticate death.

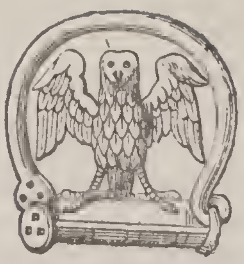
FÊTE, n. *fāt* [F. *fête*—from OF. *feste*—from L. *festum*, a festival]: a festival or holiday; a gala-day; a showy reception of company. Feted, a. *fā'tĕd*, honored with a festive entertainment. Fete-champetre, n. *fāt-shŏng-pātr* [F.]: entertainment in the open air; a rural festival. Fete Dieu: see Corpus Christi.

FETICH, or Fetish, n. *fē'tĭsh* [F. *fétiche*—from Port. *feitiço*, magic: comp. Gael. *faidh*, a prophet]: among *African negroes*, the selection of any object, as a stone, a tree, a feather, etc., as the supposed residence of a spirit, for temporary worship. Fetichism, n. *fē'tĭsh-ĭzm*, also Fe'ticism, n. *-tĭ-sĭzm*, worship of *fetiches.* The word fetich, from the Portuguese, somewhat modified, passed into the French language, through Brosse's treatise. *Du Culte des Dieux Fétiches* (Dijon 1760), and from him into German, through the medium of Pistorius (Stralsund 1785). The term has now received European recognition. A fetich is anything in nature or art to which a magical power is ascribed, e.g., stones, carved figures, or certain parts of plants, animals, etc. In this general sense fetichism coincides with the belief in charms—a belief found also among monotheistic nations. The first step *out of fetichism*, is when ignorant tribes cease to be satisfied with believing merely in the magical power inherent in their fetiches, and begin to ascribe a certain conscious operation to the objects of their reverence, especially to the fetiches in the forms of beasts or men. In this way the fetich becomes an idol, and fetichism an idolatry. The lowest form of such idolatry is where the savage does not hesitate to throw away, to chastise, or even to destroy his fetich, if it does not appear to gratify his desires. The reverence for sacred woods, mountains, streams, etc., which formed part of the religion of the old Greeks, Celts, and Germans, is

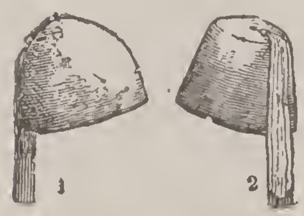
PLATE 17.



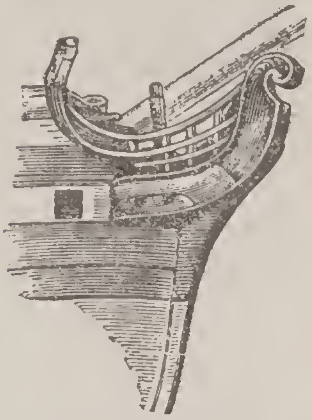
Ferns.—A, Tasselled variety of Male Fern (*A. filix-mas*, var. *Cristata*); B, Fertile frond of Royal Fern (*Osmunda regalis*).



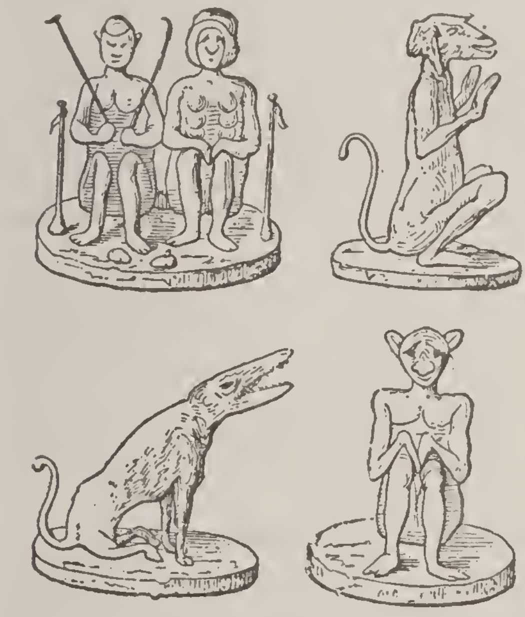
Falcon and Fetlock (Badge of Edward IV).



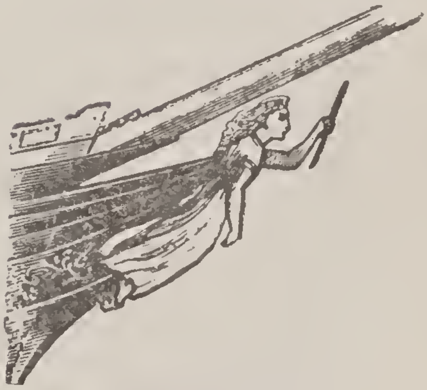
1, Egyptian **Fez**; 2, Turkish **Fez**.



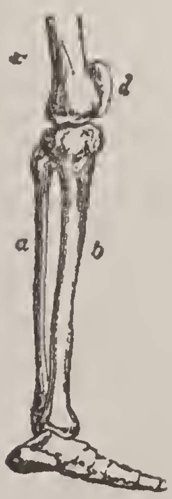
Fiddle-head.



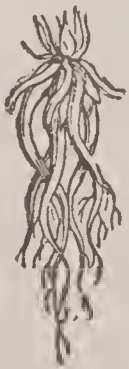
Fetiches of Dahomey.



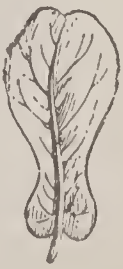
Figurehead.



a, **Fibula**; *b*, Tibia; *c*, Part of femur; *d*. Patella.



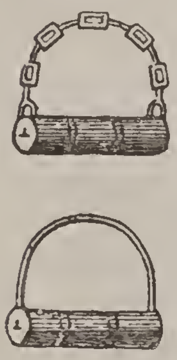
Fibrous Root.



Fiddle-shaped Leaf.

not fetichism proper, but belongs rather to the worship of nature.

FETID, a. *fĕt´ĭd* or *fē´tĭd* [F. *fétide*—from L. *fœtĭdŭs*, stinking: It. *fetido*]: having a strong offensive smell; stinking. Fe´tidness, n. the quality of smelling offensively. Fe´tor, n. *-tėr*, a strong offensive smell. Fetid limestone, variety of limestone which gives out, on being violently rubbed, or struck with a hammer, a smell like that of sulphuretted hydrogen gas. It has a dark color, produced probably from the perishable portions of the animals whose hard skeletons compose the rock. This animal matter may perhaps be the cause also of the disagreeable smell. Stinkstone or Swinestone are characteristic names for this limestone.


Fetlocks.

FETLOCK, n. *fĕt´lŏk*, or Fetterlock [Swiss, *fiesloch;* Dut. *vitlok*, the pastern of a horse: Swiss, *fisel*, unravelled threads hanging from a garment: comp. Icel. *fet*, a pace; *lokkr*, a lock of hair: Icel. *fit*, a webbed foot]: in *horses*, the tuft of hair growing a little above the back part of the hoof; the joint on which such hair grows; in *her.*, a horse fetlock seems to denote an instrument fixed on the leg of a horse when put to pasture, for preventing him from running off. In *Scotch heraldry*, a hoop is usually substituted for the chain. Fet´locked, a. *-lŏkt*, having fetlocks; tied by the fetlocks.

FETTER, n. *fĕt´tėr*—usually in the plu. Fet´ters, *-tėrz* [AS. *fœter;* Dut. *veter;* Icel. *fjötr*, shackles, bonds—from *fet*, a footstep; *fjötra*, to hinder, to hobble a horse]: chains for the feet; anything which confines or restrains: V. to put fetters on; to restrain; to shackle; to hamper; to limit; to confine. Fet´tering, imp. Fet´tered, pp. *-tėrd.* Fet´terless, a. without fetters.

FETTLE, v. *fĕt´tl* [Icel. *fitla;* Bav. *fiseln*, to make light movements with the fingers: prov. Sw. *futtla*, to fumble with the fingers]: to set in order; to repair; to set about keenly: N. good condition; proper repair: Adj. well adapted; well knit. Fettling, imp. *fĕt´ling.* Fettled, pp. *fĕt´ld.*

FETTSTEIN, n. *fĕt´stīn* [Ger. fat stone]: same as Elæolite (q.v.).

FETUS, FETAL: see Fœtus.

FETWA, or Fetwah, *fĕt´wâ* [Arab.]: in *Turkish law*, written decision of a Turkish mufti upon a legal point.

FEU, n. *fū* [Prov. *feu*, feudal tenure—from Icel. *fê;* AS. *feoh*, cattle, money, price—contr. from FEUDAL, which see]: in *Scot.*, a conditional allotment of land; a right to the use and enjoyment of lands, houses, or other heritable subjects, in perpetuity, in consideration of an annual payment in grain or money, called *feu-duty*, and certain other contingent burdens called casualties of superiority (see CASUALTY). FEU, v. to grant a perpetual right to a portion of land on which tenements may be erected, subject to an annual payment called the *feu-duty*. FEU'ING, imp. FEUED. pp. *fū'd*. FEU'AR, n. *-êr*, one who holds land or houses on a *feu-rent*.—*Feu*, though referring originally to a tenure of land on condition of military service, was frequently used to express any kind of tenure by which the relation of superior and vassal was constituted; but its narrower meaning, above indicated, is that in which it is now almost exclusively used. A feu, in short, was and is a perpetual lease; and though in Scotland feus resemble English freeholds in substance, their forms agree mostly with copyhold tenure. See Paterson's *Compendium of English and Scotch Law.* The system of feuing property for building purposes, if it were freed from some entangling and burdensome incidents, seems to have several advantages over that of the long building-leases common in England and the United States. From its perpetual character, it gives to the person actually in possession a feeling of greater interest in the property, and usually leads him to erect more enduring structures. For as time runs on, the feu often increases in value, while the reverse must always be the case with leasehold property. Neither does the feu in any degree interfere with the letting of property on lease or otherwise. Almost all the houses in Edinburgh and the other towns in Scotland which are let, either on leases or from year to year, are held by those who are spoken of as their proprietors, not in absolute property, but as feus. The deed transferring the land in feu from the superior to the vassal is called a *feu-charter*— a clumsily conceived and expensive document, which, with some of its inconvenient conditions, might to advantage be set aside for some better form. For the most part, Scotch land proprietors near towns and manufacturing villages are desirous to add to their annual rental by feuing grounds for building purposes. The rate of feu is very various, but whatever be the amount, it is payable by the feuar—not the tenant to whom the feuar may have let the property. When a building consists of several floors forming distinct dwellings, the feu-duty is allocated in certain proportions among the respective proprietors; the feuar to whom the lower floor belongs usually paying most. In properties of this kind, each is responsible only for his own share. Occasionally, feu-duties are offered for sale; and as a safe investment, bring from 25 to 30 years' purchase. In such cases, the 'vassal' (old feudal term) has an opportunity of extinguishing his feudal tenure, and becoming the superior, There are also instances of vassals sub-feuing. It is customary in feuing building lands for the superior to make the roads and drains. See Fiars: Fee and Liferent (under Fee).

FEUD, n. *fūd* [Goth. *fiathva*, enmity—from Goth. and AS. *fian*, to hate: A.S. *fœght*, seemingly another form of *fight*, allied to *foe*, and prob. to *fiend*: Ger. *fehde*, feud, quarrel: comp. Gael. *fuath*, hate]: a contention or quarrel; an inveterate quarrel between families, clans, or factions—a war waged by one of such parties, to avenge the death or other injury of one of its members. In a certain state of society, this is a legitimate, because the only mode of obtaining redress. It prevailed extensively among the nations of n. Europe; and only by gradual steps the practice was first restricted and then abolished. The laws of Rudolph I. of Germany recognized the right of waging feuds. At last, partial associations were formed, the members of which bound themselves mutually to settle their differences by courts of arbitration and compensation, without going to war.—Syn.: affray; fray; broil; contest; dispute; strife; contention; quarrel.

FEUDAL, a. *fū'dăl* [mid. L. *feudālis*, a vassal; *feudum*, applied to the property in land distributed to his companions in arms by William the Conqueror—from Prov. *feu;* It. *feudo*, conditional allotment of land: comp. Icel. *fé*, a fee or fief; *odal*, property by allodial tenure (see Fee and Feu)]: pertaining to *feus*, or *fiefs;* pertaining to the system by which lands were held on the condition of military service. Feu'dalism, n. *-ĭzm*, the principles and constitution by which lands were held by military services (see Feudal System). Feud, or Feod, n. *fūd*, a conditional allotment of land; a fief; a fee. Feu'dalist, or Feu'dist, n. [F. *feudiste*]: one versed in feudal law. Feudality, n. *fū-dăl'ĭ-tĭ*, state of being feudal; feudal form or constitution. Feudalize, v. *fū'dăl-īz*, to reduce to a feudal tenure. Feudalization, n. *-ā'shŭn*, act of reducing or conforming to feudalism or feudal tenure. Feu'dary, a. *-dér-ĭ*, holding land of a superior: N. one who holds lands by feudal service. Feu'datory, n. *-dă-tér-ĭ*, a tenant or vassal who holds his lands of a superior on the condition of military service: Adj. holding from another on certain conditions *Note.*—All such terms as *fee*, *fief*, *feu*, *feudal*, etc., had their origin in primitive and pastoral ages, when cattle implied wealth and money, and payments were made in kind or cattle. These and similar terms are accordingly derived from the general names for cattle—thus L. *pecūnĭă*, money—from *pĕcŭs*, cattle: Gael. *feudail*, cattle, herds: Goth. *faihu*, possessions.

FEU'DAL SYS'TEM: principles or social constitution, by which lands were held on condition of military service. By some, the word feu or feud, of which feudal is the adjective, is derived from the Lat. *fides*, faith, and *ead* or *odh*, or *od*, a Teutonic word signifying a property, or estate, in land; while others, with greater probability, maintain that the first syllable also is Teutonic, equivalent to *vieh*, cattle, ultimately from the same root with the Latin *pecus*, which in the form of pecunia, came to signify property, and its representative, money—because, as Varro remarks, property among pastoral nations consisted of cattle (Varr., *De Lingua Latinia*, 5, 19, s. 95, ed. Mull). See Feudal.—*Note.* A feudum, in this sense, would be a piece of land held for a *fee*, or pecuniary consideration, using pecuniary in a wide sense which its etymology suggests. Be this as it may, the feudal system, as a developed institution, belonged neither to the Teutonic nor to the Romanic nations, in their original and unmixed condition. We find it neither in the woods of Germany, nor in the Roman empire previous to the incursions of the Franks and Lombards. Neither the institutions described by Tacitus, nor those with which the Roman jurists have rendered us familiar, exhibit anything analogous to it as a whole. But they each exhibit partial indications of some of the characteristics which peculiarly distinguish it; and as it arose about the beginning of the 9th c., just when the fusion between the conquering barbarians and the subject populations of the Romanized provinces was everywhere taking place, it seems impossible to doubt that it was a result of the mutual influence of the two races. The subordination of class to class, and the intimate relations by which all the classes of the community were bound together. together with the independence and equality of the individual members of each class within itself, were among the prominent features of the simple society of the Teutonic nations; and these correspond with wonderful accuracy to the relations of superior and vassal, beginning with the sovereign and descending to the smallast feudal proprietor, and also with the equality among *peers*, which existed within each of the feudal classes. On the other hand, the incomplete and fiduciary character of the proprietorship implied in a *feu*, as held in trust from a superior on the faith of services to be rendered, or dues to be paid, bore a very close analogy to the Roman emphyteusis (from which indeed the word feu has often been derived), and to the *dominium utile* as opposed to the *dominium directum*: see Dominium: Emphyteusis.

The nature of this very important social institution, by which the life of every European people of any importance was governed from the beginning of the 9th till the close of the 13th c., and by which many of the forms of our modern life are still affected, will probably be more clearly understood if its examination be begun from below, by exhibiting the position of the simple land-holder, than by beginning with the monarch in whom it culminated, and from whom, in a technical sense, it was supposed to flow (see Allodium). The latter course has been more strictly adhered to by English writers, from the fact that, subsequent to the Conquest, the whole territory of England was regarded as the property of the conqueror, and was by him divided among his barons, and by them among their dependents, an arrangement somewhat peculiar to England (see Allodial), whereas the feudal system in its essentials was common to the whole of Europe. A feudal proprietor, then, or feudatory, was a person who held his lands from another for his own lifetime merely, in the earlier times, on condition of certain services which he was to perform to a superior or suzerain. Apart from the duties to which he was thus bound, he was not only a free man, but his position was that almost of an independent sovereign within his own small dominions. If his holding was extensive, he lived in a castle, which, notwithstanding the efforts of Charlemagne and his successors to prevent it, was generally fortified, not only for defense, but to enable him to pursue that life of rapine which in lawless times was not considered inconsistent with honesty or personal worth. For greater security, the castle was generally situated on a height, and under its walls there nestled a village, in which all the dependents of the proprietor with the exception of his immediate family, and all those who lived by the cultivation of the soil, usually dwelt—isolated farmhouses and cottages being too much exposed to plunder to admit of their being scattered over the country then. A portion of the inhabitants of each feudal domain were usually bound to the soil, and were thus subject to a species of slavery or serfdom, the conditions of which varied according to the cusoms of different districts. These were spoken of as *adscripti* or *adscriptitii glebæ*, and were called *nativi*, or bondmen, and *villein-socmen*, as opposed to free-socmen on the one hand, and serfs or *theowes* on the other, whose position is noted below. (Stephen's *Com.* i. p. 188). 'He was,' says Sir Francis Palgrave, speaking of the ceorl, 'a villain appurtenant; and, notwithstanding the language which was employed (to the effect, namely, that he could be bequeathed, bought, and sold), it must be understood that the gift, the bequest, or the sale, was in effect the disposition of the land and of the ceorl, and of the services which the ceorl performed for the land, a transaction widely differing from the transfer of a slave, whose person is the subject of the purchase.' (*Rise and Progress of the English Commonwealth*, I. 18). The ceorl, moreover, could purchase his own freedom and that of his wife and offspring (*Ib.*). See Villein. The rest were free tenants, farmers in the modern English (not American) sense, though personal services to the proprietor probably in almost every case constituted a portion of the rent which was paid: see Farmer. Latterly, when the system of subinfeudation was introduced, many of the baron's wealthier tenants came to stand to him as the lord of the domain, very much in the relation described below as subsisting between him and his lord paramount. From being tenants at-will, scarcely less subject to his authority and exposed to his caprices than the thralls, or villeins of the lowest class, they became vassals of their lord, and free citizens of what thus gradually developed itself into a feudal monarchy in miniature. The tenure by which this latter class held their lands was generally known in England as Free Socage (Stephen's *ut sup.* i. 205 *et seq.*). The castles by which the banks of the Rhine are studded from Bonn to Bingen, with their villages and parish churches, for the most part in the condition in which they were erected centuries ago, afford numerous and perfect examples of the arrangements of the feudal period. The possessors of these castles stood in a magisterial as well as a proprietary relation to their dependents. They exercised jurisdiction, extending even to the infliction of capital punishment, either in person or by means of officers whom they appointed for the purpose; and the castle was in general furnished with dungeons and other appliances for carrying their sentences into execution. Toward each other they stood in the relation of equals, or peers (Lat. *pares*); they were neighbors, simply, and friends or enemies at the case might be—too often the latter. But toward their immediate feudal superior, the count, marquis, duke, or whatever might be his title, to whom the government of the whole district belonged, they all stood in a relation which brought them in contact, and in some degree bound them to each other. Of him they held their lands on conditions somewhat similar to those on which they let them out to their own dependents. At first they were only tenants for life; but their rights in most countries very early assumed a hereditary character, the dominant proprietor's rights, on the death of atenant, being confined to the exaction of certain dues from his son and successor, as a consideration for conferring on him, or rather for confirming to him, the feu which his father had held. Where the feu, fief or feoff, as it was sometimes called from the mode of admission—feoffment—in Scotland, infeftment (q.v.)—descended to a female, the dominant proprietor was entitled to control her marriage, for the purpose of procuring himself a sufficient and trustworthy vassal; a privilege which, like all those of the lord, was latteely converted into a mere pecuniary claim. When the lord paramount, or suzerain, as he was called, held his court of justice, his vassal barons were the judges, being all on a footing of equality, or *pares curiæ*, as it was called. When he made war, either on his own account, or as furnishing a contingent to the army of the state, in such cases as in the national wars between France and England in the 12th and 13th c.—the earliest modern European instances of really national wars—his vassals were bound to attend him in person, and to furnish each the contribution of men, horses, arms, and other materials of war for which he was liable by the tenure on which he held his lands. In addition to these services, he was bound to watch and ward his castle, a duty which the minor barons almost invariably imposed on their vassals when the system of granting feus extended downward to the class of persons who had formerly been mere tenants-at-will. Then there were certain dues almost always exigible from the vassal, such as contributions toward providing a ransom for his lord when in captivity, for enabling him to celebrate the marriage of his eldest son with due pomp, or to provide a suitable dowry for his daughter. If these dues were not paid, the land reverted to the dominant proprietor, in relation to whom the vassal all along was a mere usufructuary. So far were the conditions of feudal holdings from being always the same, that no less than 80 different tenures have been enumerated; the onerous character of which varied from what was merely nominal, e. g., the payment of a white rose or a pair of spurs, 'if asked merely,' up to what was a rent in some degree corresponding to the value of the land. For an account of the manner in which the feudal system affected the constitution of land rights and the conveyance of landed property, and still affects them, see CONVEYANCING.

Inferior to all the classes of society in feudal Europe of which we have hitherto spoken, there is reason to believe that there existed almost everywhere, in the earlier times, a class of the positively unfree. The lot of those who were in absolute slavery excluded them from the influences of feudality as a legal and social institution—'they were not reckoned,' says Palgrave, 'among the people'—but their existence is by no means to be left out of account, in forming to ourselves a picture of European society in feudal times. Of the condition of this class, as forming the substratum of feudal society, a conception may be drawn from the following passage, in which Lappenberg describes them in Anglo-Saxon times, if we bear in mind, on the one hand, that subsequently to the Conquest their ranks were probably swelled by those of the Anglo-Saxon population who were in absolute poverty; and on the other, that their position, in all the countries of Europe was gradually ameliorated by the influences of Christianity, the spirit if not the letter of which has everywhere proved hostile to slavery. 'One class of the Anglo Saxon population, at the period of the Norman Conquest, consisted of the unfree or servile (*theowas, esnas*), whose number, as registered in Domesday book, was little more than 25,000. Of these, the majority were in a state of slavery by birth, whose forefathers had been either Roman slaves, British prisoners of war, or other enemies. Others, denominated, *wite-theowas*. or penal slaves, had been freemen, but reduced by the sentence of the law to the servile condition, on account of debt or delinquency. (Palgrave *ut sup.* i. 28.) The master had the right of selling the theow in the country, but not beyond the sea, even if he had perpetrated crime. In other respects, the condition of the servile seems to have differed little from that of the indigent free slaves who had a special wergild, half of which fell to the master and half to the kin.' (Thorpe's Lappenberg, ii. p. 320.) It is probable that the vast majority of the servile class in Anglo-Saxon, and even in Norman times, consisted of persons of Celtic blood. (Palgrave *ut sup.* p. 26.) In proof of this fact, Lappenberg remarks that their numbers diminish as we recede from the Welsh border and from Cornwall, the places in which the Celtic or original British population is known to have taken refuge.

The social elements which counteracted and mitigated the influences of feudality in mediæval life, were monarchy, the church, which vigorously promoted the emancipation of the unfree, and above all, the growing wealth, power, and importance of the commons. In order to free himself from the rude and insolent dictation of his great feudal vassals, the barons, the king in almost every European state, courted the alliance of the town communities, who had remained more in the condition in which they had been left by the Romans than the inhabitants of the country, and who were consequently all along more or less opposed to the growth and influences of feudality: see MUNICIPIUM, By their aid, even before the formation of standing armies, something approaching to executive power was placed in the hands of the sovereign. He was thus enabled to appoint and enforce the decrees of independent judges of his own, who in the earlier time were generally churchmen, and thus greatly to circumscribe the power and influence of all classes of feudal proprietors over their dependents. Though the period of bloom of the feudal system was from the 9th to the 13th c., in most of the countries of Europe it everywhere, in many of its features, long survived the latter period. Even considered as a social, and not merely as a legal institution, in which latter capacity it still exists, it was in many respects in vigor in Scotland till 1747, when military tenures were abolished by statute, as dangerous to public tranquillity.

FEU-DE-JOIE, n. *fŏ'dĕ-zhwâ* [F. fire of joy]: a 'running fire' of guns on any joyful occasion, the soldiers being drawn up in lines in open order—the men, beginning at the right, fire upward, one at a time, in regular succession at scarcely perceptible intervals along the whole lines, repeated three times, and followed by three cheers.

FEU'ERBACH, LUDWIG ANDREAS: German philosopher: 1804, July 28—1872, Sep. 13; b. Anspach; fourth son of Paul Johann Anselm, Ritter von F. After studying theology two years at Heidelberg under Paulus and Daub, in 1824 he was attracted to Berlin to hear Hegel, and soon abandoned theology for philosophy. In 1828 he became *privatdocent* in the Univ. of Erlangen, but in a few years quitted the academical chair, and gave his whole time to literary labor. In a small anonymous work (*Gedanken über Tod und Unsterblichkeit*, Nürnberg 1830), which attracted little attention when it appeared, he indicated that he had already gone beyond his master Hegel, by combating the doctrine of immortality. During the next few years, he published three works on portions of the history of philosophy, treating severally of the period between Bacon and Spinoza, of Leibnitz and of Pierre Bayle. But these historical works only paved the way to a critical investigation into the nature of religion and its relation to philosophy, the results of which have been given to the world in several works well known to speculative theologians. The most celebrated is his work on the Nature of Christianity (*Das Wesen des Christenthums*, Leip. 1841; 2 Aufl. 1843), translated into English. Starting from the Hegelian doctrine, that the Absolute comes to consciousness only in humanity, F. denies to the Absolute any existence beyond the human consciousness, maintaining it to be merely the projection by man of his own ideal into the objective world on which he feels his dependence. All authority above man, and consequently all moral obligation, is therefore consistently regarded as a delusion proceeding from man himself—which, if a fact, involves the conclusion that man's constant nature is itself a delusion—and the highest good is explained as that which is on the whole most pleasurable. Yet even this highest good is further explained as consisting in resemblance to that ideal humanity which man creates for himself and worships as God. A kind of ideal and unreal theism is thus retained by F.; but when his doctrines were adopted by the mass of German communists, they degenerated, perhaps logically, into an actual atheism, which ignored any moral or social law imposed on the individual from any other source than himself.—The works of F. have been collected, with additions and corrections to bring them into accordance with his later views (*F.'s Sämmtliche Werke*, 10 Bde., Leip. 1846–66). See Karl Grün's *Ludwig F.* (1874), and Beyer's *Leben und Geist F.'s* (1873).

FEUERBACH, *foy'ėr-bâċh*, Paul Johann Anselm, Ritter von: one of the most distinguished criminal jurists of Germany: 1775, Nov. 14—1833, May 25: b. Jena. Brought up at Frankfurt-on-the-Main, where his father was an advocate, and educated in the gymnasium there, he went 1792 to Jena, and then applied himself to positive law. In 1798 he appeared as criminal jurist in a work *On the Crime of High Treason*, and in the following year he began to deliver lectures in the Univ. of Jena. In his lectures and published writings, he introduced into criminal jurisprudence a new method of treatment, which was systematized in his Compendium of German Penal Law (*Lehrbuch des Gemeinen, in Deutschland geltenden peinlichen Privatrechts*, Giessen 1801; 14 Aufl. von Mittermaier 1847). This celebrated work placed F. at the head of a new school of jurists, who maintain that the decision of the judge in every case ought to be determined solely by an express deliverance of the penal law, never by his own discretion, and who on that account obtained the name of Rigorists. In 1801 F. was appointed ordinary prof. in Jena, but 1802 accepted a call to Kiel. In 1804 he was removed to the Univ. of Landshut; but next year, having received a commission to prepare a penal code for Bavaria, he was transferred to Munich as privy referendary for the ministerial, judicial, and police departments; and 1808 was appointed privy-councilor. The new penal code which he planned for Bavaria (*Strafgesetzbuch für das Königreich Baiern*, München 1813), received, after a few modifications, the royal approval, and was taken as a basis in the emendation of the criminal law of several other countries. During this period he published Remarkable Cases in Criminal

Law (*Merkwürdige Criminalrechtsfälle*, 2 Bde, Giessen 1808–11), which led the way to a deeper psychological treatment of such cases. In 1812, he published a work on Trial by Jury, to which a second vol., on the Judical Procedure of France, was added 1825, as the result of a visit to Paris 1821. In 1817 he became second pres. of the court of appeal in Bamberg, and afterward first pres. of the court of appeal at Anspach for the Rezat district. In 1832 he published a work on the unfortunate Kaspar Hauser, whose mysterious fate had strongly attracted his interest. He had just edited a collection of his miscellaneous writings, when he died at Frankfurt-on-the-Maine. An interesting life of F. has been written by his son, Ludwig (*Leben und Wirken Anselm von Feuerbachs*, 2 Bde. Leip. 1852). F. left three daughters and five sons, who have distinguished themselves in German literature.

FEUILLANS, *fèh-yângz*, CONGREGATION OF: a reform of the Cistercian order, remarkable as forming part of the great religious movement in the Rom. Cath. Church during the 16th c., contemporary with and probably stimulated by the Reformation. The author of this reform was Jean de la Barriere, abbot of the Cistercian monastery of Feuillans, who, painfully struck by the relaxation of its discipline, laid down for himself a new and much more austere course of life, in which he soon found many imitators and associates among the brethren of his order. The rule thus reformed was, after considerable opposition from the advocates of the old rule, approved, with certain modifications, by Pope Sixtus V.; the reformed congregation, however, being, still left subject to the authority of the abbot of Citeaux; and a convent was founded for them by Henry III. in the Rue St. Honoré, Paris. The subjection to the abbot of Citeaux was removed by Clement VIII. 1595; and Urban VII. 1630, separated the congregation into two branches, one for France, the other for Italy, each under a distinct general, The rules of both these branches were subsequently modified about the middle of the same century.

FEUILLANTS, *fè-yângz:* celebrated revolutionary club named from the order of the Feuillans (q.v.), whose convent in the Rue St. Honoré was the place of meeting for the club It was founded 1790 by Lafayette, Sièyes, Larochefoucauld, and others holding moderate opinions. The club, at first called the 'Company of 1789,' was intended to support the constitution against the ultra party. It reckoned among its members individuals of all classes, who took the constitution of England as their model. This opposition served, however, only to accelerate the revolutionary movement. 1791, Jan. 27, on Count Clermont Tonnerre being elected pres. of the club, a popular insurrection broke out against it; and the assembly in the cloister was forcibly dispersed by a raging mob.

FEUILLEA: *fū-ĭl'ē-a:* genus of plants of the nat. ord. *Cucurbitaceæ*, named in honor of Louis Feuillée, French botanist and traveller in Chili. The species are generally half-shrubby climbers, natives of the warm parts of

America. The seeds, at least of some, as *F. cordifolia* and *F. trilobata*, contain a great quantity of a bitter fixed oil, obtained by expression, and used for lamps. It has high reputation in the W. Indies and Brazil, as a cure for serpent-bites, and an antidote to some vegetable poisons.

FEUILLET, *féh-yā'*, OCTAVE: 1812, Aug. 11—1890, Dec. 30; b. Saint-Lô, France: author. Educated at the College of Louis-le-Grand, he became literary assistant to the elder Dumas; began his own literary career under the pen name Désiré Hazard 1844; was elected to the French Acad. 1862; appointed an officer of the Legion of Honor 1863; and was for several years librarian of the imperial residences. He has been a frequent contributor to the newspapers and reviews; written many comedies, dramas, and farces; and has exhibited excellent gifts as a writer of fiction. His publications include *Polichinelle* (1846); *Onesta* (1848); *La Rédemption* (1849); *Bellah* (1850); *Le Cheveu Blanc* (1853); *La Petite Comtesse* (1856); *Le Roman d'un Jeune Homme pauvre* (1858); *Sibylle* (1862); *Monsieur de Camors* (1867); *Julia de Trécœur* (1872); *Un Mariage dans le Monde* (1875); *Les Amours de Philippe* (1877); *Le Journal d'une Femme* (1878); *L'Histoire d'une Parisienne* (1881); *La Veuve;* and *La Morte* (1886).

FEUILLETON, *fö'ĭ-tŏng* [F. a small leaf—from *feuille*, a leaf]: in France, that portion of a political newspaper set apart for criticisms on art, literature, etc., usually separated from the main sheet by a line. The F. is an invention of the *Journal des Débats*, which, since 1800, has held an important place in the sphere of literary criticism. By degrees, the belles-lettres element began to pervade it; and the result was a species of light journalistic literature, in which Jules Janin became the acknowledged king. In the years immediately preceding the revolution, 1848, Feb., entire romances were spun out in the feuilleton. The *Constitutionnel*, in particular, made large pecuniary profits by the social romances of Eugene Sue, which it published in this manner. The French system has been imitated in England and Germany, though with less success than in France.

FEUTER, or FEWTER, v. *fū'tėr* [OF. *feutrer*, to cover with, to pad]: in *OE.*, to make ready; to fix in a rest. FEU'TERING, imp. FEU'TERED, pp. *-tėrd.*

FEUTERER, n. *fū'tėr-ėr* [OF. *vaultre*, a boar-hound]: in *OE.*, a dog-keeper; the man who lets the dogs loose from the slips.

FEVEDA, *fēv'da:* island of British Columbia, in the Gulf of Georgia, between Vancouver Island and the continent; lat. 49° 41' n., and long, 124° w.; 32 m. in length by 2 in average breadth. It possesses a snug little harbor, which has additional value from the superior quality of the fuel which abounds on the shores. The island is understood to be wholly of limestone.

FEVER, n. *fē′vér* [F. *fièvre;* OF. *fevre*—from L. *febris*, a fever—from the notion of shivering: Bav. *fibern*, to tremble with anger or desire]: a disease marked by a quickened pulse, an increase of heat, great thirst, etc.; agitation; excitement: V. to put into a fever. FE′VERING, imp. FEVERED, pp. *fē′vėrd*. FE′VERISH, a. having a slight fever; hot. FE′VERISHLY, ad. *-lĭ*. FE′VERISHNESS, n. the state of being feverish; mental restlessness. FEVER-FEW, n. *-fū* [L. *febrĭfŭgă*—from *fŭgārĕ*, to put to flight]: an herb like the ox-eye daisy. FEVER′ROOT: same as FEVERWORT (q.v.). FEVER-TREE, n. the blue gum-tree, *Eucalyptus globulus*. FEVER-WEED, n. plant of the genus *Eryngium* (see below).

FE′VER [Lat. *fēbris*, from *ferveō*, I grow warm, or perhaps from *februō*, I cleanse]: form of disease characterized principally by increase of the temperature of the body, which, however, requires to be estimated according to the state of the internal parts, rather than the external; the surface of the body, and particularly of the extremities, being frequently cold rather than warm. Having regard to the heat of the surface only, F. has commonly been considered as passing through three distinct stages, more or less marked: 1, the cold or shivering stage; 2, the hot stage; 3, the sweating stage. This description is perfectly correct in most cases, but it requires to be qualified by the remark, that even in the cold stage of fevers, it is now well ascertained that the blood and the internal organs have an elevated temperature, as estimated by the thermometer introduced into the cavities of the body. In the cold stage of F., accordingly, and even in the most violent ague, when the teeth are chattering with cold, and the whole surface is pale and clammy, the state of the system is well expressed by the aphorism of Virchow (the most ingenious and comprehensive of modern exponents of the pathology of F.), to the effect that 'the outer parts freeze while the inner burn.' Increased heat of the body, therefore, is the most essential, perhaps the only essential phenomenon of F. The other symptoms are loss of appetite, thirst, restlessness, and vague general uneasiness, often headache, and diffused pains in the back and limbs; a frequent pulse, which is sometimes full and hard; a furred tongue, often with red margin; a flushed face and suffused eyes; vitiated secretions, and general derangement of the functions, with great debility of the voluntary movements of the limbs. The disease often commences with a shivering, or rigor as it is technically called; this leads through the cold stage to the hot, which usually follows rapidly, and is attended by all the febrile phenomena in their highest degree; the skin being often very pungently warm to the hand, dry, and harsh; by and by, the pores appear to open, moisture begins to bedew the surface, and the pungent heat disappears: the disease is then about to pass into its third or sweating stage, which ushers in the convalescence. For the special symptoms of particular fevers, see TYPHUS and TYPHOID FEVERS: SMALL-POX: SCARLET FEVER: MEASLES: AGUE:INTERMITTENT FEVER: REMITTENT FEVER: YELLOW FEVER

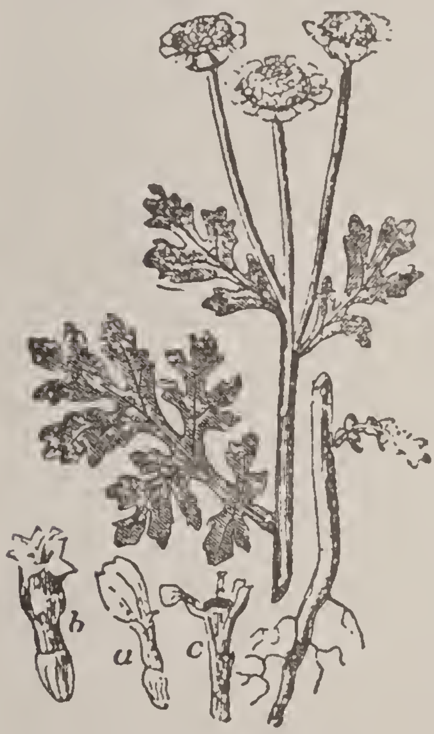
Besides being thus the leading fact in a number of specific diseases, F. is also associated with many other forms of disease as a secondary or subordinate phenomenon, connected with an inflammation or other distinctly local disease. Thus, in pneumonia (q.v.) or enteritis (q.v.) F. is as much a part of the symptoms as pain or any other; and even in some chronic or long-standing diseases, as in consumption (q.v.), a slow and consuming type of F. (see HECTIC FEVER) is very generally present. Indeed, there is no condition which rules so large a part of the physician's duty, whether in the way of distinguishing diseases or of curing them, as this constitutional state. F. is also very generally prevalent after surgical operations and injuries, of which it constitutes one of the leading dangers; and in midwifery practice, it is well known as constituting a large part of the risks of the puerperal state, whether in the slighter form commonly called *a weed,* or in the more dreaded and fatal, often epidemic, form of puerperal fever (q.v.).

The family of fevers is thus separated naturally into two large groups, in one of which the F. is the greatly predominating fact, and determines the specific character of the disease—the local disease (if present) being quite subordinate, and usually secondary in point of time; the other, where the opposite order prevails, and the F. is obviously secondary. Hence the distinction in medical language between *idiopathic* (i.e., self-originating, spontaneous) and *symptomatic* or secondary fevers. Fevers are distinguished also with reference to their mode of diffusion, as Epidemic (q.v.) and Endemic (q.v.); or with reference to their supposed cause, as contagious, infectious, malarious, pneumonic, rheumatic, etc ; or with reference to their incidental symptoms and their peculiarities of course and termination (the presumed *specific* phenomena attracting, of course, particular attention), as eruptive (see EXANTHEMA) or non-eruptive, bilious, gastric, enteric, mucous, putrid, malignant, typhoid, etc.

Among these distinctions, based upon the course of the F., one demands particular notice, as involving an important law of febrile diseases generally, and of a large class of fevers of warm climates in particular. Periodic increase and diminution, or paroxysms of longer or shorter duration, with intervals of more or less perfect relief from all the symptoms, are characteristic of most diseases of this kind, but especially of those arising from *malaria,* i.e., emanations from the soil, educed under the influence of solar heat. The duration of the paroxysms and of the intervals, the complete *intermission,* or more partial *remission,* of symptoms, become in such cases the characteristic facts that mark the *type,* as it is called, of the F., which is accordingly distinguished as intermittent, remittent, or continued; and, according to the length of the periods, tertian, quartan, quotidian, etc. (q.v.).

The true pathology, or ultimate essence of the febrile state, is still open to question; but it is in accordance with modern physiology to regard F. as connected with some complex derangement of the functions on which the animal heat is known to depend—viz., the nutrition of the textures, or the vital changes constantly in operation between the blood, on the one hand, and the ultimate atoms of solid texture, on the other. Recent observations have shown that, in the paroxysm of ague, the waste of the nitrogenous tissues is in excess; and further, the curious result appears to be arrived at, that for almost every grain of excretion representing this excess of waste in a given time, there is a proportional increase of the temperature of the blood, according to accurate thermometric observations. If such observations are corroborated and extended, it will probably appear that the cause of F. is to be found in an increased destructive decomposition of the atoms of texture through the oxygen absorbed at the lungs and circulated with the blood; perhaps under the influence of a derangement of the nervous system. Some investigators have been led by the GERM-THEORY (q.v.) to regard some of the specific fevers as parasitic diseases.

For the treatment of fever, see the several titles above referred to.



Common Feverfew (*Matricaria parthenium*):
a, floret of the ray; *b*, floret of the disc: *c*, fruit, showing the toothed membranous pappus.

FEVERFEW (*Leucanthemum parthenium*): perennial plant of the *Tubulifloræ* of the nat. ord. *Compositæ*, growing in waste places and near hedges. It is botanically allied to Chamomile (q.v.), and still more nearly to Wild Chamomile (*Matricaria chamomilla*), and much resembles these plants in its properties, but differs in appearance, the segments of its leaves being flat and comparatively broad, and its flowers smaller. Its habit of growth is erect, its stem much branched, and about 1—2 ft. high. It has a strong, somewhat aromatic smell. It was formerly a popular remedy in ague, and from time immemorial has been used as an emmenagogue. It is employed in infusion, and is stimulant and tonic. A double variety is not uncommon in gardens. It has escaped from gardens in the United States, in some places. Of the same genus is our showy but troublesome Ox-eye Daisy (*L. vulgare*), naturalized from Europe. The name Leucanthemum means white flower.

FE'VERWORT (*Triosteum perfoliatum*): perennial plant of the nat. ord. *Caprifoliaceæ*, having an erect, hairy, fistular stem, 1-4 ft. high, opposite ovato-lanceolate entire leaves, axillary whorls of flowers, with tubular 5-lobed coralla, and leathery 3-seeded berries. It is a native of N. America, where its dried and roasted berries have been occasionally used as a substitute for coffee, but it is valued chiefly for its medicinal properties, its root acting as an emetic and mild cathartic. It is sometimes called *Tinkar's Root,* from Dr. Tinkar, who first brought it into notice.

FEW, n. *fū* [Goth. *favs;* AS. *feawa;* Icel. *fár;* L. *paucus,* little, few]: not many; small in number. FEW'ER, comp. FEW'EST, sup. FEW'NESS, n. smallness of number. IN FEW, in *OE.*, with few words; in brief terms.

FEW, WILLIAM: 1748, June 8—1828, July 16; b. Baltimore Co., Md.: legislator. He received a thorough education, was admitted to the bar, and removed to Augusta, Ga., to practice, 1776. The same year he was chosen a member of the assembly and a delegate to the convention to frame a constitution, and became a member of the council. He served through the revolutionary war as col., became surveyor-gen., and presiding judge of the Richmond co. court 1778, was a representative in the continental congress 1780–83, a member of the federal constitutional convention, 1787, and one of the first two U. S. senators from Ga., 1789-93. During 1794–97 he was judge of the state circuit court. He removed to New York 1799, July., was in the legislature 1802–05, and was afterward commissioner of loans and mayor.

FEY, a. *fā* [AS. *fæge,* doomed to die: Icel. *feigr,* destined to die: Dut. *veeg,* about to die: F. *fée,* a fairy]: in *Scot.* and *OE.*, in the power of the fates; doomed; fated.

FEZ, n. *fĕz:* in *Turkey,* red cap without a brim, worn by men; a smoking-cap.

FEZ, *fĕz* (Ar. *Fas*): chief and most northerly province of the empire of Morocco; between the Atlas Mountains and the Mediterranean. It is divided into 15 districts. Pop. (Berbers, Moors, Arabs, Negroes, Jews, and a few Europeans) estimated abt. 3,200,000.

FEZ: capital of the province of F.; lat. 34° 6′ N., and long. about 5° 0′ W.; founded by Muley Edris II., 808, and reckoned during the middle ages—when it was cap. of the kingdom of Morocco—one of the most magnificent and largest cities in the Mohammedan world. It is said to have contained about 90,000 dwelling-houses, and about 700 mosques, and was celebrated for its splendid public buildings, schools, and scientific institutions. On the removal of the court to Morocco, about the middle of the 16th c., F. gradually fell into decay. It is still, however, a place of importance. The situation of F. is singular; it lies in a valley, formed by surrounding hills into a sort of funnel, the higher parts of which are covered with trees, orange groves, and orchards. It is divided into Old and New F. by one of the upper branches of the Sebu. There are 100 mosques, of which the most important is that built by the Sultan Muley Edris, which contains his monument, and is an inviolable refuge for criminals, however, guilty. On account of its numerous mosques and relics, it is regarded as the Holy City of the western Arabs. It has seven well-attended schools. The old palace of the sultan is large, but is now falling into decay. In other respects, the external aspect of F., with its numerous baths, caravanseras (of which there are about 200), and bazaars, resembles that of Mohammedan towns in general; the multitude of hotels and shops alone imparting to it a more European character. Considerable trade is still carried on, by caravans, with the adjoining countries on the s. and e. extending as far as Timbuctoo. During the period of anarchy in Morocco, 1902-3, F. was frequently the scene of bloodshed and was at alternate times held by the Sultan and the pretender. Pop. estimated from 100,000 to 150,000.

FEZZAN, *fĕz-zăn'* (correctly FESSAN): extensive oasis in the n. of Africa; s. of the regency of Tripoli. 24°–31° n. lat., and 12°–18° e. long. The north is for the most part hills, but the hills are composed of perfectly bare, black quartz sandstone, with no rivers or brooks among them, and the south is mainly a level waste of dry sand. Not more than a tenth of the soil is cultivable. In the neighborhood of the villages, which are mainly in the wadies, wheat, barley, etc., are cultivated. Camels and horses are reared in considerable numbers. Lions, leopards, hyenas, jackals, wild-cats, porcupines, vultures, ostriches, buzzards, etc., abound. The inhabitants are a mixed race, of brown color, in many respects resembling the negroes, but generally well formed. The original inhabitants belonged to the *Berber* family, but since the invasion of the country by the Arabs in the 15th c., the traces of this native N. African element have gradually become very faint. The language spoken is a corrupt mixture of Berber and Arabic. The people are far behind in civilization, and occupy themselves with gardening and the manufacture of the most indispensable necessaries of life. Considerable trade is carried on by caravans between the interior of Africa and the coast. F. is the Phazania of the ancients, against which the Romans, under Cornelius Balbus, undertook a campaign about B.C. 20. During the classic period, as well as in the middle ages, it was governed by its own princes who were at first independent, but afterward became tributary to the pashas of Tripoli. In 1842, F. was conquered by the Turks, and is now attached to the govt. of Tripoli. Pop. estimated 75,000 to 150,000.

MURZUK, cap. of F. is a well-built town with broad streets. Merchandize valued more than $100,000, £21,000 annually changes hands here, but of that amount the slave-trade supplies seven-eighths. Murzuk is now the great starting-point from the n. for the interior of Negroland. Pop. 3,000.

Compare Barth's *Travels in Central Africa* (Lond. 1857), also the descriptions given of Fezzân by Denham, Clapperton, Oudney, Richardson, Dr. Vogel, etc.

FIACRE, n. *fē-ăk'r'* [F. *fiacre*]: a hackney-coach; a hackney-coachman. The name is from St. F., anchorite of the 7th c., reputed son of a king of Scotland, who had his abode in the forest of Breuil. After his death, pilgrimages were made to his shrine, which had the repute of working miracles; and the demand for vehicles for this purpose caused the name F. to be given to coaches for hire.

FIANCÉ, n. *fē'ăng-sā'* [F. *fiancé*, masc. *fiancée*, fem.]: betrothed; a person affianced. **Fiancée**, n. fem. *fē'ăng-sā'*.

FIARS, n. plu. *fē'ėrz* or *fī'ėrz* [Icel. *fé;* AS. *feoh*, cattle, price—connected with *fee, fief, feudal* (see Feudal). *Note.*—Fiars is intimately connected with the OE. Affeer, which see]: in *Scotland* the average prices of the different kinds of grain of the growth of each county for the preceding crop, as fixed by the sentence of the sheriff, proceeding on the report of a jury summoned for the purpose, before whom the evidence of farmers and corn-dealers is produced. The values thus officially ascertained serve as a rule for ascertaining the prices of grain in all contracts where they are not fixed by the parties; and in many sales it is agreed to accept the rates fixed by the fiars. Ministers' stipends, also certain rents, so far as they consist of grain, and crown dues, are paid by the fiars prices of the county for each year. With a view to the latter, fiars, in former times, were struck in exchequer.—In England, weekly averages of *all* grain sold at public markets are ascertained and published in the *Gazette*, and this is without respect to the produce of particular counties.—See *Historical Account of the Striking of the Fiars in Scotland*, by George Paterson, Esq., Advocate, 1852.

FIASCO, n. *fē-ăs'kō* [It. *fiasco*, a flask or bottle, a failure]: a failure of any kind. The term, borrowed from the Italian theatre, and now naturalized in France and Germany, and used occasionally by English writers, signifies primarily a failure to please on the part of an actor or singer, and is thus the opposite of *furore*; though why the word, which simply means a bottle, should come to be thus applied, is more than anybody knows. In Italy, it is not uncommon to hear an audience cry out, '*Old, old, fiasco,*' even when the singer has made only a single false note. It is suggested that *fiasco* originated from the name *Fiesco*, who conspired against the Dorias, Doges of Genoa in the 13th c., but who miserably failed; hence, any complete failure of an undertaking ushered in with high hopes.

FIAT, n. *fī'ăt* [L. *fīāt*, let it be done—from *fīō*, I am made]: a formal or solemn command; a decree; an order; in *Eng. law*, a short order or warrant of a judge for making out or allowing certain processes.

FIB, n. *fĭb* [It. *fiabbare*, to sing idle songs: OE. *fible-fable*, nonsense. perhaps adapted from *fable*]: a small lie; a falsehood: V. to tell a lie; to utter an untruth. **Fib'bing**, imp. **Fibbed**, pp. *fĭbd*. **Fib'ber**, n. one who lies. **Fibster**, n. *fĭb'stėr*, *familiarly*, a liar in a silly trifling way.

FI'BER: see Musquash.

FIBRE, or Fiber, n. *fī'bėr* [F. *fibre*—from L. *fibra*, a fibre]: a strong tough thread; long stringy tissue, as wood-fibre or muscle-fibre; fine slender threads, or thread-like substances (see below). Fi'bred, a. *-bėrd*, having threads. Fi'breless, a. without fibres. Fi'bril, n. *-brĭl*, a small fibre. Fibril'læ, n. plu. *-brĭl'lē*, in *bot.*, very small and fine roots, as in the lichens. Fibrillation, n. *fĭb'rĭl-lā'-shŭn*, the state of being made up of fibres, or in appearance like fibrils. Fibril'lose, a. in *bot.*, covered with little strings or fibres. Fibril'lous, a. *-lŭs*, pertaining to fine fibres; formed of small fibres. Fi'brous, a. *-brŭs*, containing fibres; thread-like; possessing a structure separable into small threads or strings. Fibrous tissue: see Tissues. Fi'brousness, n. the quality or state of being fibrous. Fibrin, or Fibrine, n. *fī'brĭn*, a peculiar substance, found in animals and vegetables, which forms fibres and muscular flesh; the substance which forms the clot of blood (see below). Fibrina'tion, n. *-ā'shŭn*, in *med.*, state of becoming fibrinous or having an excess of fibrin, as in inflammatory diseases. Fi'brinous, a. *-brĭn-ŭs*, of or like fibrin. Fibroid, a. *fī'broyd* [Gr. *eidos*, resemblance]: resembling simple fibre in structure; denoting a tumor in which the cell elements have assumed the appearance of fibres. Fibro-cellular, in *bot.*, applied to tissue composed of spiral cells. Fibro-plastic [F. *fibro-plastique*]: in *anat.*, a term applied to a morbid formation constituted of the elements of cellular tissue, transformed in part into fibre. Fibro-vascular, applied to tissues composed of mixed vessels, containing spiral and other fibres, found in all the higher plants. Fibrous-coal, variety of coal found in Great Britain, and distinguished by fibrous structure and silky lustre. Fibrous-shells, in *zool.*, shells of fibrous structure like the recent Pinna and the fossil Inoceramus. They consist of successive layers of prismatic cells, containing translucent carbonate of lime. *Note.*—The *fibrin* of flesh and the *gluten* of wheat are almost exactly the same thing.

FI'BRE: term of very common use as applied to objects of a stringy or thread-like character, whether animal, vegetable, or mineral. Minerals are often described as of a fibrous structure or appearance, in which there is, however, no possibility of detaching the apparent fibres from the general mass, or in which they are inflexible and brittle if detached: but a more perfect example of mineral F. is found in *Amianthus*, a variety of Asbestus (q.v.). For the scientific use of F. with regard to the animal kingdom, see Muscle; for its scientific use with regard to the vegetable kingdom, see Vegetable Tissue: Wood and Woody Fibre. In its more popular, but perfectly accurate use, F. includes the hair or wool of quadrupeds, the silken threads of the cocoons of silk-worms and other insects, the fibres of the leaves and of the inner bark of plants, and the elongated cells or hairs connected with the seeds of plants, the ordinary materials of cordage and of textile fabrics.

Of mineral substances, amianthus alone has been used for textile fabrics, and that only to a very limited extent. Animal and vegetable fibres have, from the earliest ages, supplied man with cordage and with cloth. How the invention took place can only be matter of conjecture.

The animal fibres used for textile purposes are chiefly of the two classes already mentioned—(1) the wool or hair of quadrupeds; (2) the silk of the cocoons of insects. To these may be added (3) the Byssus (q.v.) of mollusks, but this class contains only the Byssus of the PINNA (q.v.) of the Mediterranean, an article of ancient and high reputation, but more of curiosity than of use. The skins and intestines of animals, though sometimes twisted or plaited for various uses, can scarcely be reckoned among the fibrous materials afforded by the animal kingdom. For information regarding the fibres obtained from the cocoons of insects, see SILK AND SILKWORM. It is to the first class that the greater number of different kinds of animal F. used for textile purposes belong; and the wool of the sheep far exceeds all the rest in importance: see SHEEP WOOL. But the wool or hair of other quadrupeds also is to some extent used, as of the Goat (see GOAT: ANGORA), the Alpaca (q v.), the Camel (q.v.), the Bison (q v:), the Musk Ox (q.v.) the Yak (q.v.), and the Chinchilla (q.v.); all of which, except the last—and it has but a doubtful claim to be mentioned—are, like the sheep, ruminants. The hair of comparatively few animals is sufficiently long for textile purposes, or can be procured in sufficient abundance to make it of economic importance. The warmth of clothing depends much on the fineness of the hair, and on other characters in which wool particularly excels.

The useful vegetable fibres are far more numerous and various than the animal. They are obtained from plants of natural orders very different from each other; none of them, however, belonging to the class of acrogenous or cryptogamous plants. They are obtained also from different parts of plants Those which are derived from exogenous plants are either the fibres of the inner bark (or BAST, q.v.), as flax, hemp, etc.; or hairs of the fruit, as cotton. The useful fibres of endogenous plants also sometimes belong to the fruit, as coir or cocoa-nut F., and the unimportant F. of cotton-grass. The spathe of some of the palms also is sometimes sufficiently fibrous and strong to be used for bags, etc., without separation of its fibres; the fibres of the interior of the stem of old cocoa-nut palms are sometimes used for coarse purposes; the fibrous character of the stems of the slender palms called rattans, of bulrushes, etc., fits them for wicker-work, for plaiting into chair-bottoms, and the like; the roots of the *Agaves* (q.v.) yield fibres useful for various purposes; but generally, the more valuable fibres obtained from endogenous plants are those of their leaves, either of the leaf-stalks—as Piassaba fibre and Gomuto or Ejoo F., both produced by palms—or of the blade of the leaf, as Pine-apple F., Pita Flax, New Zealand Flax, Bowstring Hemp, etc. The fibres of the leaves of endogens being parallel to each other, are easily obtained of sufficient length for economical purposes; while the reticulated fibres of the leaves of exogens, even if long enough, which is comparatively infrequent, cannot be separated for use. The *bast* fibres of exogens, however, are often of sufficient length, and easily separable. Their separation is accomplished generally by steeping in water or by frequent bedewing with water to cause a partial rotting of the other parts of the bast and of the bark which covers it. But the fibres of endogens being in general discolored and injured by this process to a much greater degree than those of exogens, mere mechanical means are usually preferred for their separation, such as beating, passing between rollers, and scraping. The fibres of many leaves are separated by scraping alone. The fibres of *fruits*, as cotton, exist in nature in a separate state, like the wool or hair of animals, and require merely to be collected and cleaned.

A complete enumeration of the kinds of vegetable F. applied to economical purposes would not be easy. Flax, Hemp, and Cotton have long had pre-eminence. To these have recently been added New Zealand Flax, Jute, Sunn or Sunn Hemp, Coir, Pita Flax, Abaca or Manilla Hemp, Bowstring Hemp, China Grass, Piassaba, and many others. New kinds are continually being brought under notice; and industrial exhibitions and industrial museums have beneficially contributed to this. New kinds, however, do not immediately command the attention that they deserve. 'If a new product is sent into the market,' says Dr. Royle, 'few of the regular customers will buy it, as they want that to which their machinery and manufactures are suited.' But for the judgment and enterprise of Mr. Salt, it might have been long ere alpaca wool had obtained its present place among the materials of manufactures; and there is much reason to think that many vegetable fibres, now little regarded, may yet in like manner be exalted to importance.—For the use of vegetable fibres in the manufacture of paper, see PAPER.

FIBROUS PLANTS. Of plants which yield fibres employed for economical purpose, the following is a list not complete, but practically useful. For many plants here enumerated, see their separate titles, or the natural orders. The most important are indicated by capitals.

I. EXOGENOUS PLANTS.

1. *Fibres of the Fruit.*

NAT. ORD. *Malvaceæ.* COTTON, produced by species of *Gossypium.*
——— *Sterculiaceæ.* Silk-cotton, or vegetable silk, the produce of *Bombax villosum*, etc.
——— *Asclepiadaceæ.* The silk-like down of the seeds of Virginian Silk (*Asclepias Syriaca*).

2. *Fibres of the Inner Bark or Bast.*

NAT. ORD. *Malvaceæ.* Deckanee Hemp (*Hibiscus cannabinus*).—Other species of *Hibiscus, Althæa cannabina, Sida abutilon*, etc.
——— *Sterculiaceæ.* A number of species of different genera; some of them cultivated to a small extent.
——— *Tiliaceæ.* JUTE (*Corchorus olitorius, C. capsularis*, etc.)—The bast of some trees of this family, as the Linden or Lime (*Tilia Europæa*, etc.) is used for mats, ropes, etc.: see BAST.
——— *Linaceæ.* FLAX, the produce of *Linum usitatissimum.*

Nat. Ord. *Leguminosæ.*—Sunn, Jubbulpore Hemp, etc., the produce of species of *Crotalaria.*
Spanish Broom (*Spartium junceum*).
Bokhara Clover (*Melilotus arborea*).
Dhunchee (*Sesbania aculeata*).
Species of *Cytisus* (as Common Broom), Butea, *Parkinsonia*, *Bauhinia*, etc.
——— *Asclepiadaceæ.* Jetee (*Marsdenia tenacissima*).
Yercum or Mudar (species of *Calotropis*).
Virginian Silk (*Asclepias Syriaca*, *A. debilis*).
Other species of several genera.
——— *Apocynaceæ.* Canadian Hemp (*Apocynum cannabinum*).
——— *Urticeæ.* Common Nettle (*Urtica dioica*) and other species of *Urtica.*
Species of *Bœhmeria*, one of them yielding China Grass Fibre.
——— *Cannabinaceæ.* HEMP (*Cannabis sativa*).
Hop (*Humulus lupulus*).
——— *Moraceæ.* The bark of some species of Fig.
——— *Coniferæ.* Inner bark and roots of some species of Pine and Fir.
——— Unknown Buaze.

II. Endogenous Plants.

Nat. Ord. *Liliaceæ.*
New Zealand Flax, fibre of leaves of *Phormium tenax.*
Bowstring Hemp, fibre of leaves of species of *Sanseviera.*
Fibre of leaves of species of *Aloë* and of *Yucca.*
——— *Amaryllideæ.* Pita Flax, fibre of leaves of *Agave Americana.*
Fibre of leaves of species of Fourcroya.
——— *Musaceæ.* Abaca or Manilla Hemp, and Plantain Fibre, obtained from leaves of species of *Musa.*
——— *Bromeliaceæ.* Pine-apple Fibre, Curratow, etc , fibres of leaves of species of *Bromelia*, etc.
——— *Pandanaceæ.* Fibres of leaves of Screw-pines.
——— *Palmaceæ.* Coir or cocoa-nut fibre, from husk of cocoanut. Fibre of cocoa-nut stem. Gomuto or Ejoo fibre, from leaf-stalks of Gomuto Palm (*Arenga saccharifera*).
Piassaba, from *Attalea funifera* and *Leopoldinia Piassaba* (the Chiquichiqui Palm).
Other fibres from leaf-stalks, etc., of many palms.
——— *Cyperaceæ.* Fibre from leaves of *Eriophorum cannabinum* (see Cotton-grass). Mats, chair-bottoms, etc., made of different *Cyperaceæ.*
——— *Gramineæ* or Grasses. Esparto (*Stipa tenacissima*).
Moonja (*Saccharum munja*).

FI'BRIN, or Fibrine: an organic compound, occurring in animals and plants. In chemical composition it closely resembles albumen and caseine, and it was until recently believed that these three substances possessed a common radical, to which the name *proteine* was given, the proteine being regarded as the primary basis of all the tissues, of the body. Hence we frequently find F. described as one of the proteine bodies.

F. is distinguished from the allied substances, albumen and caseine, by its separation in a solid state, in the form of extremely delicate filaments or lamellæ. from any fluid in which it is dissolved, very shortly after the fluid is taken from the organism. Animal F., which is of great physiological importanee, occurs principally in the blood, the lymph, and the chyle. It results from the union of two albuminoids, fibrinogen, and fibrinoplastic substances, which exist separately in the blood. To obtain F., beat or stir the blood with a bundle of twigs, to which the F. adheres in strings. The impure F. thus obtained is then rinsed with water, boiled with alcohol and ether,—to remove fatty matters—and dried. In healthful venous blood, it scarcely ever amounts to 3 in 1,000 parts, its average quantity being 2·3. Small, however, as its amount is, it varies more than any other constituent of the blood—and in acute inflammatory diseases sometimes exceeds its average by five or six times. Moreover, arterial blood contains more F. than venous blood. In the lymph and chyle, it occurs in considerably less quantity than in the blood. In inflammatory exudations, we find F. in the contents of the serous cavities—for example, of the pleura and peritoneum—and on the mucous membrane (as in croup); in these cases, it occurs usually in a state of spontaneous coagulation. There are good physiological reasons for believing that F. is formed from albumen, and not directly from the food; and as F. contains a little more oxygen than albumen, it has been inferred that it is formed from the latter by a process of oxidation. As, however, more F. is found in the blood in pneumonia—when a considerable portion of the lungs is rendered impervious to air—than in almost any other disease, we are inclined to adopt the opposite hypothesis, that the augmentation of the F. in inflammatory blood is caused by an insufficient supply of oxygen. When oxygen is abundantly introduced into the blood, the F. rapidly undergoes further transformations: on the other hand, when, in consequence of impeded respiration, the quantity of oxygen conveyed to the blood is not sufficient to effect the further normal oxidation or transformation of the F., we have an accumulation of that constituent in the circulating fluid. It has, however, been a disputed question, whether F. is produced in the elaboration or in the disintegration of the tissues. For the discussion of this subject, and of other points connected with F., see any standard work on Physiological Chemistry.

The substance forming the mass of flesh or muscular tissue was formerly regarded as identical with coagulated blood-fibrine. The two substances are, however, chemically distinct, and the muscle-F. will be described under its new chemical name, SYNTONIN (from *sunteinein,* to contract or render tense).

FIBRINOGEN, n. *fī-brĭn'ō-jĕn* [Eng. *fibrin,* and Gr. *gennăō,* I produce]: one of the two substances in blood which produce fibrin, the other substance being named ‘fibrinoplastic’ or ‘paraglobulin’. FIBRINOGENOUS, a. *fī'brĭn-ŏj'ĕ-nŭs,* uniting with paraglobulin to form fibrin. FIBRINOPLASTIC, a. *fī'brĭn-ō-plăs'tĭk* [Eng. *plastic*]: uniting with fibrinogen to form fibrin. FI'BRINOPLAS'TIN, n. *-plăs'tĭn,* another name for paraglobulin; a substance supplied from the blood.

FIBROIN, or FIBROINE, *fī'brō-ĭn:* $C_{71}H_{107}{\cdot}N_{24}O_{25}$, or $C_{15}H_{23}N_5O_6$. Both these formulæ have been given to fibroin, which constitutes the chief part of the fibre of silk. It is extracted by digesting the silk with water, under a pressure of three atmospheres, and then removing the fat with ether; it is a white mass. Boiled with dilute sulphuric acid, it yields leucine, tyrosine, and glycocine. It is the principal constituent of cob-webs and the horny skeletons of sponges.

FIBROLITE, n. *fī'brō-līt* [L. *fibra*, a fibre; Gr. *lithos*, a stone]: in *mineral.*, monoclinic, transparent or translucent mineral, occurring in gneiss, mica schist, and related metamorphic rocks in Bohemia, Bavaria, and parts of the United States. Color, brown or olive-green. Fibrolite was much used for stone implements in w. Europe in the Stone Age.

FIBULA, n. *fĭb'ū-lă* [L. and It. *fibŭlă*, a buckle]: the outer and smaller bone of the leg; in *archæol.*, a kind of brooch or pin; in *mason.*, iron cramp by which stones are fastened together; in *surg.*, needle for sewing up wounds. FIB'ULAR, a. *-lėr*, pertaining to or situated near the *fibula*. FIB'ULATED, a. *-lā-tĕd*, resembling a brooch or buckle.

FICHTE, *fĭch'tĕh*, IMMANUEL HERMANN: professor of philosophy at Tübingen: 1797, July 18—1879, Aug. 8; b. Jena; son of Johann Gottlieb F. He early applied himself to philosophical studies, being attracted by the later views of his father, which he considered essentially *theistic*. He also attended the lectures of Hegel, but felt averse to his pantheistic tendencies, and leaned more to Schleiermacher and Schelling. Occupied at first as a teacher, F. was appointed prof. of philosophy in Bonn 1836, and 1842–63 held a chair in the Univ. of Tübingen. His chief works are—*Beiträge zur Characteristik der neuern Philosophie* (1841), *Grundzüge zum Systeme der Philosophie* (1839–47); *System der Ethik* (1850); *Anthropologie* (1856); *Psychologie* (1864); *Vermischte Schriften* (1869), etc. He suggested meetings of philosophers similar to those held by physicists; and at one at Gotha 1847 he delivered an address *On the Philosophy of the Future* (Stuttg. 1847). The great aim of his speculations has been to find a philosophic basis for the personality of God, and for his theory on this subject he has proposed the term *Concrete Theism*, to distinguish it alike from the abstract theism which makes God almost an unreality—a barren aggregate of lifeless attributes; and on the other hand, from the all-absorbing pantheism of Hegel, which swallows up the human and the divine in its own inapprehensible totality. F.'s *Zur Seelenfrage* was translated by J. D. Morell (*Contributions to Mental Phylosophy*, 1860). Later works were *Die Theistische Weltansicht*, 1873; *Fragen und Bedenken* (1876). During the movements of 1848, he issued several political tracts. From 1863 onward he lived in retirement at Stuttgart, where he died. The principle of F.'s politics is not unlike Dr. Arnold's maxim. He holds that there is only one kind of real conservatism, that of constant well-planned reform; and that all revolution consists either in attempts to precipitate prematurely the future, or to go back to ideas that are effete, the last being only the chrysalis form of the first. The state, 'according to the idea of benevolence,' belongs to the future.

The regeneration of Christianity would consist in its becoming the vital and organizing power in the state, instead of being occupied solely, as heretofore, with the salvation of individuals. To this recent school of philosophy belong Weisse, Chalybœus, Wirth, and others.

FICH'TE, Johann Gottlieb: 1762, May 19—1814, Jan. 27; b. Rammenau, Upper Lusatia: illustrious German philosopher. His earliest years were marked by a love of solitary musing and meditation. When a mere child he was wont to wander forth to upland fields, that he might enjoy the pleasure of gazing into the illimitable distance. In 1775, he was placed at the gymnasium of Pforta, near Naumburg; and 1780 he entered the Univ. of Jena, where he applied himself first to theology, afterward to philosophy. During 1784–88, he supported himself in a precarious way as tutor in various Saxon families. Subsequently, he went to Zurich in a similar capacity, where he made the acquaintance of the excellent lady who afterward became his wife, Johanna Maria Rahn. In 1791, F. obtained a tutorship at Warsaw, in the house of a Polish nobleman. The situation, however, proved disagreeable, and was given up by the fastidious philosopher, who went to Königsberg, where he had an interview with Kant, of whom he had become an ardent disciple. Here he wrote, 1792, his *Kritik aller Offenbarung* (Critique of all Revelation), which he showed to that philosopher, who praised it highly, but still maintained a certain air of reserve toward the enthusiastically earnest author, which pained the latter greatly. At Königsberg, F. was reduced to such straits for want of the means of subsistence, that he was forced to ask the loan of a small sum of money from Kant, which the latter was stoical enough to refuse. Things were now at the worst with F., and of course—according to the old adage—they began to mend. He entered the delightful family of the Count of Krokow, near Danzig, as tutor; was enabled to marry; and 1794 was appointed to the chair of philosophy at Jena, where he commenced to expound with extraordinary zeal his system of transcendental idealism. F., in fact, *preached* his philosophy as if he believed its reception essential to the salvation of his hearers. In 1795, he published *Wissenschaftslehre* (Doctrine of Science), in which he clearly broke away from Kant, whose speculations did not seem to him sufficiently thorough, or, as Englishmen would say, *idealistic*. Indeed, as early as 1793, writing to Niethammer, he says: 'My conviction is, that Kant has only *indicated* the truth, but neither unfolded nor proved it.' An accusation of atheism, which F. fervidly but fruitlessly refuted, cost him his chair 1799. In the previous year, he published his *System der Sittenlehre* (System of Ethics, Jena 1798). considered by many his most mature work. He now removed to Berlin, where he delivered lectures on philosophy to a select auditory. In 1800, appeared *Ueber die Bestimmung des Menschen* (On the Destiny of Man). In 1805, he obtained the chair of philosophy at Erlangen, with the privilege of residing at Berlin in the winter. Here he delivered his celebrated lectures, *Ueber das Wesen des Gelehrten* (On the

Nature of the Scholar, Berlin 1805–6). In the same year, appeared *Grundzüge des gegenwärtigen Zeitalters* (Characteristics of the Present Age); and 1806, *Anweisung zum seligen Leben oder die Religionslehre* (The Way to the Blessed Life, or the Doctrine of Religion). But F. was a patriot as well as a philosopher. The victories of Napoleon at Auerstadt and Jena drew forth the famous *Reden an die Deutschen* (Addresses to the Germans). These addresses were full of the most exalted enthusiasm. F. 'laments that his age has denied him the privilege accorded to Æschylus and Cervantes, to make good his words by manly deeds.' The Prussian king appreciated the zeal of the eloquent metaphysician, and, on the restoration of peace, requested him to draw up a new constitution for the Berlin University. In 1810, the univ. was opened, with a host of brilliant names, F., Wolff, Müller, Humboldt, De Wette, Schleiermacher, Neander, Klaproth, and Savigny. By the votes of his colleagues, F. was unanimously elected rector. Here, as at Jena, he labored with unremitting energy for the suppression of all those customs which he deemed barbarous in themselves, and incompatible with the true idea of a scholar. In 1813, the war of independence broke out, and the hospitals of the Prussian capital were soon crowded with patients. F.'s wife was one of the first who offered her services as a nurse. For five months, she tended the sick with all the patient tenderness and devotion of her nature. At last, she was seized with fever, 1814, Jan. 3. After a fearful struggle, she recovered; but her husband caught the infection, and in spite of all remedies, sank under its influence, and died.

It is difficult to speak calmly of Fichte. His life stirs one like a trumpet. He combines the penetration of a philosopher with the fire of a prophet, and the thunder of an orator; and over all his life lies the beauty of a stainless purity. See *Fichte's Leben und literarischer Briefwechsel* (published by I. H. Fichte, 2 vols. 1831; 2d ed. 1862); and Dr. William Smith's *Memoir* (Lond. 1848). The fundamental notion of the idealism set forth in F.'s writings, at least in the earlier of them, is the sole reality of the *Ego* or I, which posits both itself and the *Non-ego*, or Not I. (The phrase 'to posit,' it ought to be observed here, signifies in German Metaphysics, to present to the consciousness Hence, when it is said that the *ego* posits itself, the meaning is, that the ego becomes a fact of consciousness, which it can become only through the antithesis of the *non-ego*.) Under this ego, however, must not be understood, according to the usual misapprehension, the human and finite, but the 'absolute subject-objectivity' (*absolute subject-objectivität*), the eternal, universal reason. The ego is the absolutely productive, which, however, would not attain to consciousness of itself—i.e., of its infinite spontaneous activity, did it not at the same time place in contrast to itself, and as an impediment (*anstoss*) and limit to its activity, the non-ego—i.e., the objective world, or nature. The ego, so far as it is determined by the non-ego, is the intelligent ego, and, as such, the subject of theoretical science;

the ego, on the other hand, as determining the non-ego, is the subject of practical science. Freedom, absolute, spontaneous activity, for its own sake, is not with F., as with Kant, the condition and pre-supposition of moral action, but is itself the highest expression of the problem of the moral law. To realize this self-activity, however, the ego requires an external world of objects, in order that in them as limits it may become conscious of its own activity. To this idealistic system of ethics it has been plausibly—some think unanswerably—objected that it asserts that the non-ego is required as the condition of morality, and at the same time represents the removal of this condition as the aim of moral effort. With respect to the idea of right, F.'s theory of freedom, in its fundamental principles, attached itself to the Kantian theory of freedom as the innate and primitive principle of right. Generally speaking, F. makes that which, from the stand-point of ordinary consciousness, we call the world, merely a product of the ego; it exists only through the ego, for the ego, and in the ego. F. himself afterward modified or extended his system, to bring out more prominently the *theistic* character of his metaphysics. The transition to this later stage of F.'s philosophy is seen in *Bestimmung des Menschen* (Destination of Man). It arose from the intense religiosity of his nature. F. was essentially a worshipping nature, and though he never ceased to be a philosopher, the untiring aspiration of his later years was to realize in his own way the belief of the great Jewish lawgiver: 'The eternal God is thy refuge, and underneath are the everlasting arms.' A popular exposition of his philosophy is given in his *Anweisung zum seligen Leben.* It is set forth in a strictly scientific manner in the lectures in the *Nachgelassene Werke,* edited by I. H. Fichte (3 vols. Bonn 1834–5), in which his *Speculative Logik* and his revised theory of right and morals are particularly deserving of attention. Although F. never, strictly speaking, formed a school, and though his system has been adopted by only a few, such as J. B. Schad, Mehmel, Cramer, Schmidt, and Michaelis, his influence upon the subsequent development of German philosophy has been very important. F.'s collective works have been published by his son, I. H. Fichte. See the admirable little work on F. by Prof. Adamson (1882). His popular works have been translated into English by Dr. William Smith; their titles are—*The Destination of Man, The Vocation of the Scholar, The Nature of the Scholar, The Way to the Blessed Life,* and *The Characteristics of the Present Age.*

FICHTELGEBIRGE, *fĭch'tĕl gā̆-bĭr'gĕh:* range of pine covered mountains on the n. frontier of Bavaria, from which the principal ranges of Germany diverge. It extends from the vicinity of Baireuth n.e. 36 m. to the frontier of Bohemia, where it is merged into the Erzgebirge which continues in the same direction. The Main, Naab, Eger, and Saale rivers rise among its summits, the highest of which are the Ochsenkopf (ox-head) 3,397 ft., and the Schneeberg (snow mountain) 3,450 ft. The range receives its name from the great pine forests which cover it.

FICHU, n. *fĭsh'ô* [F. *fichu*—from *ficher*, to fix on]: a small handkerchief worn on the neck, or on the neck and over the shoulders.

FICINO, *fe-chē'nō*, MARSILIO: illustrious philosopher of the Italian Platonic school: 1433–99; b. Florence; son of the principal physician of Cosmo de' Medici. To the liberality of this prince he owed the classical culture which inspired his career. At the suggestion of Cosmo, F. undertook the translation of Plotinus, Iamblichus, Proclus, and Porphyry, besides a Latin but by no means literal version of Plato. In 1463, he was appointed by Cosmo pres. of a classical soc. or acad., founded 1440, having for its aim the diffusion of the Platonic doctrines, which F. held to be the basis and confirmation of the Christian system. On the death of Cosmo, F. was favored by that prince's grandson, Lorenza de' Medici; and at the mature age of 40, he entered the priesthood. His theological doctrine, while undoubtedly sincere, is a strange medley of incongruous views, the natural result of his attempt to fuse the philosophy of Plato with the Christian creed. F.'s collected works, published at Basel (2 vols. f. 1491), consist of translations from the Greek philosophers, and original metaphysical and theological compositions, among which are the *Theologica Platonica, De Religione Christiana,* the Latin epistles, and a Commentary on the Epistles of St. Paul.

FICKLE, a. *fĭk'l* [AS. *ficol*, vacillating: Ger. *ficken*, to move quickly to and fro: comp. Gael. *faicill,* caution, care]: apt to change in mind or purpose, generally associated with minds of a light and trifling character; wavering; unstable; of a changeable mind; variable. FICKLENESS, n. *fĭk'l-nĕs,* the state of being fickle; inconstancy; uncertainty.—SYN. of 'fickle': capricious; inconstant; irresolute; unsettled; vacillating; unsteady; changeable; changeful; mutable.

FICO, n. *fē'kō* [It. *fico*, a fig—from L. *fīcŭs*]: in *OE.*, a fig; an act of contempt expressed by raising the arm and snapping the fingers = a fig for you.

FICOIDEÆ, n. *fī-koy'dē-ē* [L. *ficus*, fig; Gr. *eidos*, form, appearance]: in *bot.*, name given by Jussieu to the order called by Lindley *Mesembryaceæ.*

FICTILE, a. *fĭk'tĭl* [L. *fictĭlĭs*, earthen—from *fictus*, formed or shaped: It. *fittile*]: molded into form by the potter's art; pertaining to pottery. FIC'TOR, n. *-tėr,* an artist who works in wax, clay, or other plastic material.

FICTION, n. *fĭk'shŭn* [F. *fiction*—from L. *fictĭōnĕm*, a making, a feigning—from *fictus*, feigned, invented: It. *fizione*]: the act of inventing; that which is feigned or invented; a falsehood; a fable; novel literature. FIC'TIONIST, n. a writer of novels. FICTI'TIOUS, a. *-tĭsh'ŭs*, feigned; not real; false. FICTI'TIOUSLY, ad. *-lĭ*. FICTI'TIOUSNESS, n. the state of being fictitious.—SYN. of 'fiction': fable; fabrication; parable; novel; romance; allegory; invention; falsehood;—of 'fictitious': artificial; counterfeit; spurious; supposititious; feigned; unreal; false.

FIC'TION: see NOVELS.

FIC'TION OF LAW: 'a supposition of law that a thing is true, which either is certainly not true, or at least is as probably false as true.'—Erskine, *Inst.* iv. 2, 38. Fictions have existed in all legal systems, and must be regarded as a species of legal falsehood, understood to be such, resorted to as enabling individuals who, by the strict letter of the law, would have been excluded from obtaining redress of evils, to procure redress. Two general maxims regulate the application of legal fictions—viz., that no F. shall be allowed to operate a wrong, and that no F. shall be admitted which in the nature of things is impossible. The Roman form of judicial procedure abounded with fictions, by which alone, in many cases, a party aggrieved could enforce his right. Thus, an heir, unjustly disinherited, by the *querela inofficiosi testamenti,* feigned that his father had been mad. A stranger in Rome, who had been robbed, could not obtain restitution without the *fictio civitatis,* whereby he feigned himself a citizen. Many of the fictions existing in Rome have found a counterpart in modern systems; thus, the *fictio longæ manus,* whereby lands at a distance were feigned to be delivered, resembles an English feoffment at law; in like manner, the *fictio traditionis symbolicæ* of keys of a warehouse to give possession of the articles contained therein, and of a deed in confirmation of the convenants contained therein. The *fictio unitatis personarum* was the original of the Scottish fiction, that the heir is *eadem persona cum defuncto.* But in no system of laws have fictions been so liberally adopted as in that of England. It is by means of fictions alone that the original limited jurisdiction of the courts of queen's bench and exchequer has been extended to ordinary suits. In the latter court, every plaintiff assumed that he was a debtor to the crown, and was debarred from discharging his obligation by the failure of the defendant to satisfy his demand; in the former, it was assumed that the defendant had been arrested for some supposed trespass which he had never in fact committed. The fictitious characters of John Doe and Richard Roe long contributed to make the action of ejectment famous. And though these fictions have disappeared before the ruthless hand of modern legislation, yet to this day, in an action at the instance of a father for the seduction of his daughter, damages can be awarded only on the assumption that she was his servant, and that he has suffered pecuniary loss by deprivation of her services. In chancery, the whole doctrine of uses and trusts is based on a fiction. Perhaps the best explanation of the introduction of fictions into legal systems is in Dr. Colquhoun's *Summary of the Roman Civil Law,* 2027. It involves, he says, 'less difficulty to adhere to known and admitted forms, and gradually to accommodate them to the changed state of society, than to upset all the incidents connected with them by a sudden change, which must ever tend to unsettle the law and practice of the courts. All nations have therefore found it more desirable to let the one glide into the other, than to adopt any abrupt measure which might disturb the practice and effect of former decisions.'

FICTIVE, a. *fĭk'tĭv* [F. *fictif*, fictitious—from L. *fĭctīvŭs*—from *fictus*, invented]: feigned; pretended or unreal. FIC'TIVELY, ad. *-lĭ*, in a pretended or feigned manner.

FICTOR, n.: see FICTILE.

FI'CUS: see FIG.

FID [from Lat. *findere, fidi*, to divide]: instrument for splicing ropes. It is a large pointed pin with an eye at the thick end, of iron or lignum vitæ, used by sailors in separating and interlacing the strands of which the rope is composed. Fid is also a small thick lump of anything; a bar or pin of metal or wood used to support or steady anything; a plug of oakum for the vent of a cannon. MAST-FID, bolt inserted through the bottom of a ship's topmast or top-gallant-mast, with ends resting on the trestle-trees sustained by the head of the lower mast or topmast. Unless the mast-fid be withdrawn, the supported mast cannot be lowered.

FIDALGO, n. *fē-dăl'gō* [Port.]: nobleman or one royally descended: see Spanish HIDALGO.

FIDDEMIN: one of the handsomest villages of the Fayûm, inhabited by a Mussulman and Coptic population. It is surrounded by fruit trees, and is remarkable for a large olive, supposed to be the original one planted in Egypt, and yielding annually 268 pounds of olives.—Clot Bey, *Aperçu générale sur l'Egypte* (8vo, Paris 1840), I. 213.

FIDDLE, n. *fĭd'l* [Ger. *fiedel;* Dut. *vedele*, a fiddle—from mid. L. *vitŭla*, a violin: L. *fĭdēs*, any stringed instrument]: a violin (q.v.). FIDDLER, n. *fĭd'lėr*, one who plays on a fiddle. FIDDLE-BLOCK, in *naut.*, a long block having two sheaves of different diameters in the same plane, not in parallel planes, as in a double-block; a viol, or long tackle block. FID'DLE-FAD'DLE, n. *-făd'l* [a word directly imitative of the light rapid movements of the fiddle-bow]: a trifling or fanciful matter; trifling talk: ADJ. trifling; making a bustle about nothing. FIDDLE-FISH, the angel-fish, from its resemblance to a fiddle. FIDDLE-GRASS, in *bot.*, *Epilobium hirsutum.* FIDDLE-HEAD, in *naut.*, the ornamental carving at the bows of a ship, when it is made in the form of a scroll or volute similar to the end of a fiddle. FID'DLESTICK, n. the bow for playing a fiddle; a term employed for a thing below notice. FIDDLE-WOOD, genus *Citharexylum.* From the fact that the French *fidéle* (applied to one species from its durable qualities) has become corrupted into Eng. *fiddle*, has arisen the erroneous notion that the wood of this genus is suitable for making violins. The error has been perpetuated also in the Latin name, which means harp-wood. FIDDLER'S-FARE, meat, drink, and money. FID'DLING, a. trifling: N. the playing on a fiddle. TO PLAY FIRST FIDDLE, to act as head man or chief. TO PLAY SECOND FIDDLE, to act a subordinate or inferior part.

FIDEICOMMISSUM, *fĭd'ē-ī-kŏm-mĭs'sŭm*, in the Civil Law: conveyance of property in trust to be transferred to a third person named by the truster. *Fideicommissa*, when introduced, were not supported by the law. The performance of them depended, therefore, on the conscience of the party intrusted, and they were consequently often not carried out. They were adopted originally for the purpose of conveying property either where a party, from the circumstances of the case, as inability to procure the proper number of witnesses, was prevented from executing a will; or where he desired to benefit those who, by law, were precluded from taking the property. To effect this purpose, an actual conveyance was made to a friend, coupled with a request that the property should be transferred to another. Fideicommissa having thus been introduced for a special purpose, were by degrees extended to conveyances of the whole inheritance, and finally were used for the purpose of settling estates in a particular order of succession, forming the earliest instance of entails (q.v.). Fideicommissa received the sanction of positive law first in the reign of Augustus, by whom authority was given to the pretor to enforce the performance of these fiduciary obligations.—*Institutes*, ii. 23, s. 1. Emperor Claudius subsequently extended this authority to the consuls and presidents of provinces. Fideicommissa were either *particular* or *universal*, the former a bequest of a particular subject, or a part only of the inheritance; the latter comprehending the whole estate.—In *Holland*, the principles of the civil law as to fideicommissa form an important branch of the law in regard to landed estates. Grotius *Dutch Jurisprudence*, by Herbert, b ii. c. 20.

FIDEJUSSION, n. *fī-dē-jŭ'shŭn* [L. *fides*, faith; *jubeo*, I order]: state or act of being bound as surety for another; suretyship; bail. FIDEJUS'SOR, *-jŭs-ér*, surety; one bound for another.

FIDELITY, n. *fĭ-dĕl'ĭ-tĭ* [F. *fidélité*—from L. *fidēlĭtātem*, faithfulness—from *fĭdēs*, faith: It. *fidelita*]: faithfulness; integrity; veracity; honesty.—SYN.: constancy; steadiness; steadfastness; firmness; stability; permanence; faith; loyalty; fealty.

FIDES, n. *fī'dēz* [L.]: in *myth.*, the goddess of Faith and Honesty; in *astron.*, see PLANETOIDS.

FIDGET, v. *fĭj'ĕt* [Icel. *fika*, to climb up nimbly: Sw. *fika*, to hunt after: Swiss, *fitschen*, to flutter to and fro: Dut. *ficken*, to switch: Ger. *fick-facken*, to fidget]: to make light involuntary movements; to be unable to keep still: N. restless agitation. FIDG ETINESS, n. *-ĭ-nĕs*, the quality or state of being fidgety; nervous restlessness or uneasiness; a fidgety person. FIDG'ETING, imp. FIDG'ETED, pp. FIDGETY, a. *fĭj'ĕt-ĭ*, restless; uneasy; impatient. FIDG'ETS, n. plu. restlessness: uneasy and irregular motions, arising from some cause of irritation which requires muscular action for its relief.

FIDICULA, *fĭ-dĭk'ū-la:* small musical instrument in the shape of a lyre.

FIDONIA, n. *fī-dō-nĭ-a:* in *entom.*, genus of Lepidoptera, belonging to the family *Geometridæ* or geometers, formerly called *Bupalus*. *F. piniaria* (the bordered white moth) is a beautiful insect having its wings on the upper side of a dusky-brown color, and adorned with pale yellow spots. The larvæ feed on fir.

FIDUCIAL, a. *fĭ-dū'shĭ-ăl* [L. *fidūcĭă*, confidence—from *fīdō*, I trust: It. *fiduciale*]: confident; undoubting; of the nature of a trust. Fidu'cially, ad. *-lĭ*. Fidu'ciary, a. *-ėr-ĭ*, unwavering; held in trust: N. one who holds anything in trust; one who depends on faith without works. Fiducial mark, a standard or reference mark on an instrument.

FIE, int. *fī*]Icel. *fy:* Ger. *pfui:* W. *ffi*]: an exclamation of dislike or disapprobation.

FIEF, n. *fēf* [F. *fief*, a fief, a tenure—from mid. L. *feodum*, or *feudum* (see Fee)]: land held of a superior on condition of military service; land held of a superior: see Feudal System. *Note.*—Littré derives from O.H.G. *fihu*, or *feho*, possessions, goods, cattle—see Skeat.

FIELD, n. *fēld* [Ger *feld:* Dut. *veld*, the open country, soil: prov. Dan, *fald*, an inclosed portion of cultivated soil]: a piece of land inclosed for tillage; the open country; a battle-ground; room; space; the entire space within which objects are seen by a telescope or microscope. In *her.*, the surface of the shield; the blank space on which figures are drawn or projected; so called, according to some, because it represents the field of battle on which the achievements or charges represented on it are supposed to have been gained. In blazoning, the tincture or metal of the field must be the first thing mentioned. Field'ed, a. in *OE.*, in the field of battle. Fielding, the act of catching or stopping and returning to the wicket-keeper balls hit by the batsmen; in *vinegar manuf.*, exposure to the open air and sun of malt-wash, or gyle in casks, in order to promote its acetification. Field-allowance, daily sum of money granted to officers to meet extra expenses while on active services. Field-book, note-book used in surveying. Field-bug in *entom.*, the genus *Pentatoma*. The name is intended to distinguish it from the bed-bug. Field-colors, small flags of about eighteen inches square used for marking out the ground for squadrons and battalions. Field-cornet, magistrate of a township in the Cape Colony. Field-day, a military review; a gala-day. Field-duck, in *zool.*, *Otis tetrax*, or little bustard. It is a native of France. Field-glass, *glăs*, a telescope; a binocle; the lens usually interposed between the object-glass and eye-glass of a microscope, which, receiving the diverging rays from the former, before they form an image, contracts the dimensions of the image, and increases its brightness, so as to render it of a proper size and degree of distinctness for being viewed by means of the eye-glass: see Field of View: Microscope. Field-madder, in *bot.*, a common modern book-name for *Sherardia arvensis*, a plant belonging to the order *Rubiaceæ*. Field marshal, *-mâr'shăl*, highest rank of general officers in the British and some foreign armies. In the British army, it is a special honor given to very few officers, and conferred only by selection, on the ground either of distinguished service or of royal birth. When unemployed, the field-marshal has no higher pay than any other general. The equivalent rank in the British navy is that of admiral of the fleet. Formerly, a captain-general was occasionally appointed, who had rank higher even than a field-marshal. FIELD-MOUSE, popular name for certain species both of MOUSE and of VOLE: see these titles. FIELD-OFFICER, one competent to command a whole battalion—viz., major, lieutenant-colonel—in distinction from one of those merely intrusted with company duties, as a captain, lieutenant, sub-lieutenant. FIELD-PIECE, a cannon mounted on a wheeled carriage for moving about from place to place in the field. FIELD-SPORTS, diversions in the open country, as in shooting and fishing. FIELD-TRAIN, department of the artillery, consisting of commissaries and conductors of stores, responsible for safe custody of the ammunition, for formation of proper depôts of shot, etc., between the front and the base of operations, and that a due proportion shall be constantly at the service of each gun during an engagement. FIELD-VOLE, in *zool.*, *Arvicola agrestis*, or short-tailed field-mouse. FIELD-WORKS, intrenchments and other temporary fortifications thrown up by an army in the field, either as protection from a hostile force, or to cover an attack on some stronghold: see FORTIFICATION. FIELD OF BLOOD: see ACELDAMA. FIELD OF ICE, a large mass of floating ice in the sea or large river. FIELD OF VISION OR VIEW, the whole space within which objects can be seen through an optical instrument; more strictly, the space within which the image of an object may be seen by whole pencils. That part of the image which is seen by partial pencils of the light from the object speculum or lens is called the *ragged edge*, and usually a diaphragm is employed to cut it off altogether from the view of the observer. TO KEEP THE FIELD, to continue in active operations, as an army. TO TAKE THE FIELD, to commence active operations against an enemy. IN THE FIELD, employed in a campaign against an enemy.

FIELD, *fēld*, CYRUS WEST: 1819, Nov 30—1892, July 12; promoter of submarine telegraphy; b. Stockbridge, Mass.; son of David Dudley F. (q.v.). He was educated in his native town, became a clerk in New York 1834, and began manufacturing paper 1840. In 1853 he partially retired from business, and spent several months in S. American travel. The same year, being asked to furnish the money to build a land-telegraph across Newfoundland to expedite news from Europe, he conceived the idea of stretching a line across the Atlantic ocean. He consulted with his brother David Dudley F., Peter Cooper, Marshall O. Roberts, Moses Taylor, and Chandler White, and, receiving assurances of financial support from them, went to Newfoundland 1854, and obtained from its legislature the exclusive right for 50 years of landing telegraph cables from Europe and America on that island. Returning to New York he organized the New York, Newfoundland and London Telegraph Company with the above gentlemen, of whom Messrs. Cooper, Roberts, Taylor, and White, agreed to contribute $20,000 each, and after soliciting financial aid in England, he subscribed for a fourth interest. Within two years lines were completed from New York across Newfoundland. In 1855 a cable designed to extend from Newfoundland to Cape Breton Island was lost in a storm while being laid, but a second cable was successfully laid the next year. This became inoperative within a short time. In 1856 he organized the Atlantic Telegraph Company in London, for which he furnished over one-fourth the capital, and after several attempts and failures telegraphic communication between the two continents was established 1866, July 27 (see ATLANTIC TELEGRAPH). In connection with this work he made over 50 passages across the Atlantic, during nearly 13 years of anxious, unceasing toil. Congress unanimously voted him a gold medal and the thanks of the nation, and unusual honors would have been conferred upon him had be been a British subject. In 1867 he received the grand medal—its highest prize—of the Paris Exposition. In 1869 he was the representative of the New York chamber of commerce at the opening of the Suez canal, and subsequently was interested in laying cables between Europe, India, China, Australia, the West Indies, and S. America; also in the construction of the Third ave. elevated railroad in New York, and the management of the Wabash St. Louis and Pacific railroad. He made a trip around the world 1880, erected a monument to Maj. André, on his property at Tarrytown, N. Y., which was first partially then wholly destroyed with dynamite by persons unknown; and in conjunction with his brothers prepared and gave a public park and a library to the town of Stockbridge, and built there a church in memory of his parents. The closing years of a notable and useful career were embittered by the loss of most of his fortune in Wall street in 1890, and the disastrous and criminal failure of his son in 1891, which swept away nearly all that he had.

FIELD, DAVID DUDLEY, D.D.: 1781, May 20—1867, Apr. 15; b. East Guilford, Conn.: Congl minister. He graduated at Yale 1802, studied theol. with the Rev. Charles Backus, was licensed to preach by the New Haven Congl. Assoc. 1803, Sep.; was ordained pastor of the Congl. Church, Haddam, Conn., 1804, Apr. 11, and remained there till 1818. He then made a missionary tour through w. N. Y., and in 1819, Aug., was installed pastor of the only church in Stockbridge, Mass. After a faithful service of 18 years there, he returned to his Haddam congregation, and ministered there till 1844, when on the division of the congregation he went to Higganum; where he officiated 7 years, afterward making his permanent home in Stockbridge. He was vice-pres. of the Conn. Hist. Soc., and corresponding member of the Mass. and Penn. Hist. Socs. He published *History of the County of Berkshire* (1829); *History of the County of Middlesex* (1839); *History of Pittsfield* (1844); and *Genealogy of the Brainerd Family* (1857). He received the degree D.D. from Williams College 1837.

FIELD, DAVID DUDLEY, LL.D.: 1805, Feb. 13—1894, Apr. 13; lawyer; b. Haddam, Conn., son of David Dudley F. (q.v.). He graduated at Williams College 1825, studied law in Albany and New York, was admitted to the bar 1828, and practiced continuously in New York till 1885. From an early period in his professional career he labored to secure a reform in the practice of law. In 1839 his first efforts resulted in a *Letter on the Reform of the Judiciary System*, the substance of which he presented in an address to a legislative committee that had been appointed through his influence. He prepared and gained the introduction of three bills on the subject 1841, but no decisive action was taken on them. Five years later he published in pamphlet *The Reorganization of the Judiciary*, and the constitutional convention of 1846 recommended a general code such as he suggested. His next step was the publication of *What Shall be Done with the Practice of the Courts? Shall it be wholly Reformed? Questions addressed to Lawyers* (1847), and soon after its appearance he was appointed a commissioner to reform the practice in the state. At the end of two years he reported two codes of procedure, one civil, the other criminal. The former was almost wholly adopted by the state and has since been adopted by 23 states and territories. In 1857 he was appointed chairman of a commission to codify the whole body of the law, and 1865 reported a political code, penal code, and civil code. Nearly 25 years were spent in the preparation of these 5 codes. Later he headed an organization for the reform and codification of the law of nations, looking to arbitration for the settlement of international disputes. He filled an unexpired term in congress 1876, was one of counsel for the democratic party before the electoral commission 1876–7, and in later years acted with that party.

FIELD, EUGENE: journalist and poet: 1850, Sep. 2—1894, Nov. 4; b. St. Louis, Mo.; son of Roswell Martin F., first attorney for Dred Scott. He entered Williams Coll. 1868, Knox Coll. 1869, and the Univ. of Missouri 1871, leaving the latter at the beginning of his senior year, when he travelled abroad, having inherited about $70,000. On his return he entered the field of journalism, first in St. Louis, Mo., then in Chicago, where he remained till he died. His place was in the front rank of journalistic humorists, though he attained fame as a writer of loving and pathetic verses concerning children. His love for children was the inspiration of his best poetry. He published a number of books, prose and poetry, the latter being lyrical.

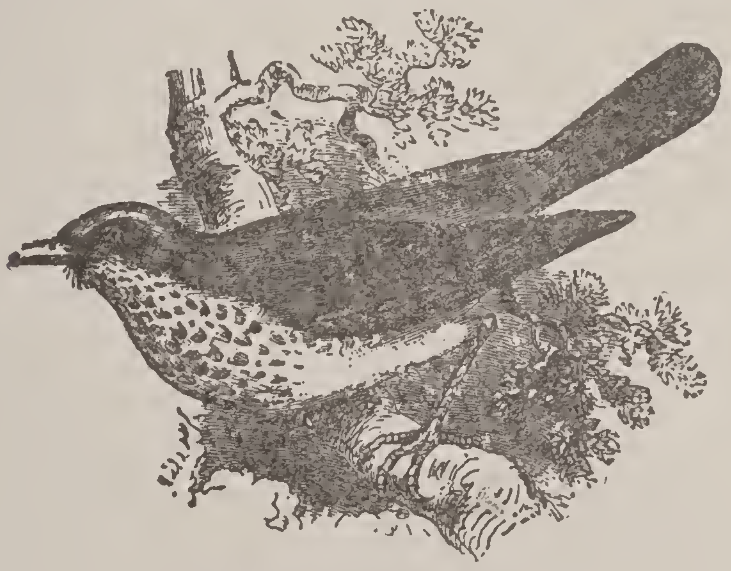
FIELD, HENRY MARTYN, D.D.: Presb. clergyman: b. Stockbridge, Mass., 1822, Apr. 3; son of David Dudley F., D.D., Congl. pastor in that town. He graduated at Williams College 1838, studied theol. in E. Windsor Seminary and at Yale Divinity School, and was installed pastor of a Presb. church in St. Louis, Mo., 1842. He remained there five years, then spent three years in European travel, was a witness of the revolution in France and Italy 1848, and returning to the United States held a Congl. pastorate in West Springfield, Mass., 1851–54. In the latter year he removed to New York and became editor of the *Evangelist,* of which he subsequently became sole proprietor. He made a tour of Europe 1858, a journey around the world 1876–7, and a visit to the Holy Land, 1882. His published works include *The Good and the Bad in the Roman Catholic Church* (1848); *The Irish Confederates and the Rebellion of* 1798 (1851); *Summer Pictures: From Copenhagen to Venice* (1859); *History of the Atlantic Telegraph* (1866); *From the Lakes of Killarney to the Golden Horn,* 2 vols. (1876); *From Egypt to Japan* (1877); *On the Desert* (1883); *Among the Holy Hills* (1884); *The Greek Islands and Turkey after the War* (1885); and *Gibraltar* (1888). He is a most charming and instructive writer of travels, and his successive volumes have been received with wide popular favor.

FIELD, Kate: author: 1840–96, May 19; b. St. Louis, Mo.: daughter of Joseph M. F. She received a seminary education in Mass., and studied music in Europe, spent several years in foreign travel, and while abroad corresponded wth the New York *Tribune,* Philadelphia *Press,* Chicago *Tribune,* Boston *Courier* and *Transcript,* New Orleans *Picayune,* and Springfield *Republican,* and wrote numerous magazine articles and reviews of foreign subjects. In 1874 she made her first appearance as an actress as *Peg Woffington* in Booth's theatre, New York, and 1882–3 was pres. of a ladies' cooperative assoc. in New York. She was a skilful dramatic critic, and she attained popularity as a lecturer. Miss F. published *Planchette's Diary* (1868); *Adelaide Ristori* (1868); *Mad on Purpose,* comedy (1868); *Pen Photographs from Charles Dickens's Readings* (1868); *Haphazard* (1873); *Ten Days in Spain* (1875); and *History of Bell's Telephone* (1878). In 1890 she started a personal journal, *Kate Field's Washington,* which was discontinued 1895.

FIELD, Stephen Johnson, ll.d.: assoc. justice U. S. supreme court: b. Haddam, Conn., 1816, Nov. 4; son of David Dudley F., D.D., Congl. pastor in that town. When 10 years old he accompanied a married sister to Smyrna to study oriental languages, graduated at Williams College, 1837, studied law with his brother David Dudley F. in New York, became his partner after being admitted to the bar, spent the year 1848 in European travel, and removed to Cal. 1849. Shortly after reaching San Francisco he became a founder of Marysville, was elected its first alcade, 1850, Jan., and a member of the legislature in Oct. following, serving on the judiciary committee and taking a conspicuous part in the task of regulating the civil and criminal procedure of the courts of the state. In 1857 he was elected a judge of the supreme court of Cal. for six years, but before the time for entering upon his duty was appointed to fill a sudden vacancy on the bench of that court, and became chief justice on the resignation of David S. Terry, 1859, Sep. He held this office till 1863, when he was appointed by Pres. Lincoln an assoc. justice of the

U. S. supreme court, which office he resigned 1897. In 1869 he was appointed prof. of law in the Univ. of Cal., 1873 member of a commission to prepare amendments to the codes of the state for legislative action, 1877 became a member of the electoral commission (q.v.) and voted with the minority in favor of the democratic claim, and 1880 was a candidate before the national democratic convention for the presidential nomination. He was a man of deep scholarship and great independence of character, and during the exciting days of the early statehood of Cal. rendered many decisions at personal peril. In a number of instances like the Puebla case (1864), the test-oath and 'iron clad' oath cases, and the legal-tender, New Orleans slaughter-house, confiscation, and Chinese queue cases, his keen decisions rendered him locally unpopular and elicited wide comment. But in all, his personal courage, profound legal erudition, and judicial integrity were never once questioned by right-minded and orderly citizens. Judge F. received the degree LL.D. from Williams College 1864. He died 1899, Apr. 9.

FIELDFARE, n. *fēld'fär* [AS. *fealo-for*—from *fealo*, yellowish; *faran*, to go or wander], (*Turdus pilaris*): species of Thrush (q.v.), in size about equal to the blackbird, but with greater length of wing; general color gray, feathers tipped with a brownish black elongated spot; throat and breast reddish yellow, streaked and spotted with black; forepart of the back and wings of rich brown color; tail slightly forked and nearly black; under parts white. The F. is a very common winter visitant of Britain, though it rarely breeds even in the n. parts of the island. It arrives from more northern regions when the winter has fully come, and departs toward the end of spring. It is well known to youthful sportsmen, and affords much employment for their guns during the Christmas holidays, when it may generally be found in small flocks—often with its smaller congener the redwing—in fields, if the weather is mild, feeding on worms, snails. etc., or, in severe weather,



Fieldfare (*Turdus pilaris*).

about hedges, thickets, and woods, wherever haws and other such fruits or seeds are abundant. Its winter migrations extend south as far at least as the islands of the Mediterranean. It is one of the summer songsters of the n. of Europe and of Siberia; its song is soft and melodious, but is less often heard than its call-note, which is harsh. It is extremely plentiful in Norway, where its nests are generally built in spruce firs, and, contrary to the ordinary habits of thrushes, in society; numerous nests being often in the same tree, and '200 nests or more being frequently seen within a very small space.' The F. is easily tamed, and sings well in captivity.

FIELDING, *fēld'ĭng,* Copley Vandyke: abt 1787–1855, Mar. 3; English painter in water-colors. He began to exhibit 1810. For many years he held the office of Pres. of the Soc. of Painters in Water-colors, and was generally recognized as the representative of that branch of art in England. He died at Worthing, in Sussex, after a career of steady prosperity. Possessing remarkable mechanical dexterity and knowledge of effect, F. painted with what severe critics would call fatal facility. He contributed about a score of pictures annually to the exhibition of the Water-color Society. Yet, he always exhibited a certain easy finish of treatment, perhaps of itself a kind of secondary talent. Although his range of subjects was but limited, yet within it he was almost unrivalled. As a painter of marine effects, and of the landscapes of down and glade, it is thought by many that he has had as yet no equal.

FIELDING, Henry: 1707, Apr. 22—1754, Oct. 8; son of Gen. Edmund F., connected with the Earls of Denbigh. He was sent to Eton, and then to the Univ. of Leyden, for legal study. Returning to London, he began to write for the stage, and between 1727–36 produced nearly a score of comedies and farces, which were forgotten with nearly as much speed as they were produced. He married 1736, and falling heir to a small estate, he, with his young wife, retired from London. But his was not a Fortunatus's purse, and his hand was continually in it; and in three years after his marriage, he was back in London a student at the Temple. He was called to the bar at the usual time, but gout intervening, steady practice was rendered impossible. Happily, a way of escape was at hand. Richardson published *Pamela;* the town was ringing with it; and F., whose strong, healthy, unconventional nature revolted from the moral priggishness of 'Virtue Rewarded,' resolved to write a counterpart, purporting to be the adventures of Pamela's brother, *Joseph Andrews.* This work, begun in a satirical mood, and intended merely to quiz Richardson, deepened as it proceeded and flowered out into humorous adventure. The exquisite character of Parson Adams took the world by surprise, and remains one of the permanent treasures of English fiction. The next important work undertaken by F. was *Jonathan Wild,* a master-piece of irony, which has never been sufficiently appreciated, and which doubtless suggested to Mr. Thackeray the scope and conduct of *Barry Lyndon*. The rebellion of 1745 induced F. to undertake the direction of the *Jacobite Journal*, in support of the Hanoverian succession; and shortly afterward as a reward for his loyalty, he was, through the influence of Lord Lyttelton, promoted to a pension, and to the place of justice of the peace of Middlesex and Westminster. While engaged in magisterial duties, he produced *Tom Jones*, his most famous fiction, which the world has not ceased to read, nor critics to admire. His next work was *Amelia*—less striking and masterly than its predecessor, but quieter in style, and enriched with scenes of domestic tenderness. Shortly after its publication, he was attacked by dropsy, jaundice, and asthma. Seeking relief, he went to Lisbon, but after a few months' residence died there. See the life prefixed to Leslie Stephen's edition of F. (10 vols. 1882), and the short work on F. by Austin Dobson (1883).

F. was the first great English novelist, and he remains to this day one of the greatest. *Tom Jones* is a miracle of invention, character, and wit. It contains the most amusing scenes and adventures, the most sparkling delineations of life, high and low, the most abundant satire. Everywhere, the author's manliness, shrewd sense, and scorn of meanness and hypocrisy, are apparent. On the other hand, it must be said that F.'s nature was more robust than delicate; that it was deficient in the sentimental and poetic side; and as a consequence, that his ideal of woman is not high, and his descriptions of the tender passion either commonplace or extravagantly rapturous. The love-scenes between Tom and Sophia, and the episode of the 'Man of the Hill,' meant to be passionate and poetic, are the portions of the great novel which readers skip. It is to be regretted that all F.'s works are disfigured by coarseness of circumstance and expression; but that was the fault of the time as much as of the man. He was coarse, for the same reason that he wore ruffles, drank claret, and hated the Pretender. He set himself to paint society as he saw it, and painted it truthfully.

FIELD OF THE CLOTH OF GOLD: historical name of the place between Ardres and Guisnes, where the French King Francis, entertained the English King Henry VIII. with unprecedented magnificence, 1580, June 4–24. Francis was anxious to gain the support of Henry and Cardinal Wolsey in his impending conflict with Charles V. of Germany, who had been elected Emperor of Spain also the previous year. Charles had previously sought the friendship of Henry and his famous cardinal, and had made a virtual promise of the papacy to the latter. Francis, enraged at Charles's election to the throne that he himself coveted, subsequently made the same promise to Wolsey, who is credited with arranging the meeting of the French and English courts on French soil. All manner of feats of chivalry, gallant exercises, dancing, dramatic representations, and even a wrestling match between the sovereigns, were provided. Though Francis's hospitality was boundless, he failed in his object. Henry, who held the balance in his hand, returned Charles's visit after his entertainment by Francis, and declared his desire to remain impartial but that he should pronounce against the aggressor. Francis began hostilities and in the midst of disasters, 1522, May 29, received a declaration of war from Henry. See Shakespeare's *Henry VIII., Act* 1, *Scene* 1.

FIELDS, *fēldz*, James Thomas, ll.d.: 1717, Dec. 31—1881, Apr. 24; b. Portsmouth, N. H.: author and publisher. He received a public school education, became a clerk in a bookstore in Boston when 17 years old, read the anniversary poem before the Mercantile Library Assoc., the following year, helped establish the publishing firm of Ticknor, Reed & F., soon after attaining his majority, and continued a member of it through several changes of name till 1870. He edited the *Atlantic Monthly* 1862–1870, collected and issued De Quincey's writings in 21 vols., lectured frequently before the Dartmouth and Harvard college societies, and after retiring from the firm made a number of lecturing tours through the United States. He was author of editions of *Poems* (1849, 54, 58): *Yesterdays with Authors* (1872); *Hawthorne* (1876); and *In and Out of Doors with Charles Dickens* (1876); and with Edwin D. Whipple edited the *Family Library of English Poetry* (1877). He received the decree ll.d. from Dartmouth College 1867.

FIEND, n. *fēnd* [Goth. *fiands;* Ger. *feind*, an enemy—from Icel. *fiá;* Goth. *fian*, to hate: Icel. *fiandi*, a hater, an enemy]: an infernal enemy; an implacable or malicious foe; the devil. **Fiend'ish**, a. like a fiend; also **Fiend'-like**, a. **Fiend'ishly**, ad. *-lĭ*. **Fiend'ishness**, n. the quality of a fiend; intense maliciousness.

FIERAMENTE, adv. *fē-ār·a-mĕn'tā* [It.]: in *mus.*, proudly; fiercely; boldly.

FIERCE, a. *fērs* [F. *feroce;* OF. *fers*, fierce—from L. *fĕrōcĕm*, fierce—from *fĕrus*, wild]: savage; furious; very violent or passionate; very eager; outrageous. **Fierce'ly**, ad. *-lĭ*. **Fierce'ness**, n. ferocity; fury; violence.—Syn. of 'fierce': barbarous; fell; ferocious; wild; violent; impetuous; unrestrained; ardent; vehement.

FIERDING COURT, *fērd'ing kōrt*, (Fierding Thing): district court in use among the early Gothic nations. This court was established, to render speedy justice in small matters. There were four of these courts in every hundred, each presided over by a separate judge, whose jurisdiction extended to all causes where the matter in dispute did not exceed the sum of three marks, Stiernhook, *De Jure Goth.*, lib. i. c. 2.

FIERI FACIAS, n. *fī'ĕr-īfā'shĭ-ăs* [L. *fiĕrī*, to be made; *făcĭăs*, you may make, you cause]: the first conspicuous words of a writ in Latin authorizing certain legal steps to be taken to recover a debt or damages allowed by the court. **Writ of Fieri Facias**, writ for enforcing the judgment of a court of law against the goods of a debtor. It may be sued out as soon as final judgment has been signed, or, in case of a trial out of term, in 14 days after verdict, unless, on special cause shown, a judge order speedy execution.

But a writ of fieri facias cannot be enforced after a *Capias ad satisfaciendum* (q.v.) has been issued, The sheriff, in executing this writ, may not break open outer doors; but having obtained peaceable entrance, he may break open inner doors, cupboards, and trunks, The officer in execution having taken possession, may leave an assistant in charge, by whom an inventory of the goods is made. He is entitled to remain on the premises a reasonable time, in order to remove the goods; but if he continue longer without permission of the owner, he is liable to an action for trespass. The goods of the party only who is named in the writ may be seized (certain needful articles to a small amount being exempt from seizure); and if the officer take goods belonging to a stranger, he is liable to an action for damages For the corresponding process in Scotland, see POINDING. *Fieri facias de bonis ecclesiasticis* in Eng. law, is a writ directed to the bishop of the diocese, requiring him to attach the ecclesiastical goods of a clergyman within his diocese, in satisfaction of the judgment of a court of law.

FIERY, a. *fīr'ĭ* [from *fire*, which see]· passionate; irritable; easily provoked; like fire; bright; impetuous. FIER'INESS, n. *-ĭ-nĕs*, hot qualities; heat of temper. FIER'ILY, ad. *-ĭ-lĭ*. FIERY CHAMBER. see CHAMBRE ARDENTE.—SYN. of ‘ fiery ’: burning; ardent; hot; scorching; venement; impetuous; fierce; unrestrained; heated.

FIESCHI, *fē-ĕs'kē*, GIOVANNI LUIGI, Count: abt. 1523–1547, Jan. 2: member of one of the most illustrious houses of Genoa. His name has a tragic celebrity in connection with a conspiracy of which he was the chief. Andrea Doria, a famous admiral, sprung from a race hereditarily at feud with that of F., having expelled the forces of Francis I. from the state, had restored the republican government, but at the same time, by his vigorous administration, effectually held in check the ambition of the nobles. Count F. organized a plot, having for its object the death of Doria, and his nephew Gianettino, whom specially F. hated, and the establishment of an oligarchic government. Instigated by the approval of France and Rome, and supported by an alliance with the Duke of Parma, F. speedily enrolled a formidable array of accomplices, his three brothers among the foremost. Crowds of his own feudal retainers were secretly armed and assembled from the various hereditary lands of the house; three galleys, purchased with the connivance of the pope, were fully equipped, and all being in readiness, the attempt was fixed for 1547, Jan. 2. Doria, in spite of repeated warnings, refused to ascribe treacherous or subversive designs to F., whom he regarded as a fast friend and partisan. Complete success seemed at first to be with the conspirators; the gates of the city were forced, the fleet captured, Gianettino assassinated, Doria in flight F. had but to appear and dictate, but he was nowhere to be found: in stepping from one galley to the other in the darkness of night, F. had stumbled, and falling overboard, was borne down by his ponderous armor, and miserably drowned in the harbor, or, according to some, stifled in the slime.

FIES'CHI, Joseph Marco: 1790–1836, Feb. 16; b. Corsica: conspirator and assassin, on the life of King Louis Philippe. A profligate career appears to have reduced him to great poverty about 1835, when he conceived the diabolical design of assassinating King Louis Philippe—the immediate cause being the suppression of a situation which he held, by order of the Prefect of the Seine. Disguising his crime under the cloak of political enthusiasm, he leagued with himself two or three obscure persons, of pothouse politics, who hated the government of the Citizen King. F. planned and caused to be made an infernal machine with 20 barrels, that could be simultaneously discharged. On the approach of the king and queen, at the review of the National Guards, in the Boulevard du Temple, 1835, July 28, he fired his machine, and killed 18 people, among whom was Marshal Mortier, who fell dead beside his sovereign. The king escaped with a mere scratch, and continued the review. F. was immediately seized, and with his three accomplices, was tried, condemned, and put to death.

FIESOLE, *fyā'zo-lā* or *fe-ĕs'o-lā* (anciently, *Fæsulæ*): one of the most ancient Etruscan cities; on the crest of a hill, about three m. from Florence, of which it may be said to be the parent city. From the heights of F., the view presented by Florence and the neighboring valleys is gorgeous in the extreme. We find F. first mentioned B.C. 225, during the great Gaulish war. Hannibal encamped here after crossing the Apennines. The city was destroyed by Sulla in the Social War (B.C. 90–89), and he afterwar dispatched thither a military colony. At the invasion of Tuscany by the Goths, F. also fell under their dominion, and being by nature and art a formidable stronghold, was numerously garrisoned by the barbarians. The growth of Florence during the middle ages gradually reduced it to insignificance. The only vestige of Etruscan structures still remaining is the cyclopean city wall, of huge blocks of stone, many portions of which are wonderfully perfect. The site of the Etruscan fortress is now occupied by a convent, and interesting fragments of the foundations are often brought to light. The amphitheatre and other remains belong to the Roman age. The very ancient church of St. Alexander, supposed to have been originally a pagan temple, contains an altar dedicated to Bacchus, the inscription of which is, however, illegible, owing to a fissure in the middle. Coins and other relics have been repeatedly dug up. Pop. abt. 2,500.

FIE'SOLE, Fra Giovanni da (known also as *Il beato Angelico*): one of the regenerators of Italian art: 1387–1455; b. Mugello. In 1407 he entered the Dominican order, and, with his brother, consecrated his artistic abilities exclusively to sacred aims, illustrating various works of devotion with beautiful miniature designs. These early artistic efforts are remarkable for rich effects of coloring, gorgeous illumination, and exquisite elaboration of the most minute ornamental details. Having achieved high reputation as frescoe painter by some noble compositions with which he endowed his own and other convents, he was commissioned by Cosmo de' Medici, with the decoration of the church of Santa Annunziata and the convent San Marco. Each cell of the convent was adorned with a fine fresco of large dimensions, and amid other painting, can still be distinguished F.'s 'Annunciation.' The fame of this work induced Pope Nicholas V to summon him to Rome, and intrust him with the execution of a series of illustrations taken from the life of St. Laurence, destined to embellish the private chapel of St. Laurence in the Vatican. See Giangiacomo Romano, *Le Pitture della Cappello di Nicolò V.* etc. (Rome 1810). So rigid a disciplinarian was F., that no private or public work was ever undertaken without the formal consent of his superiors being obtained, and to them all pecuniary remuneration was transferred. The archbishopric of Florence, spontaneously offered him by the pope was humbly declined. He died in Rome. The gallery of Florence possesses several pictures of F., still undimmed in brilliancy of coloring One of these, the *Birth of John the Baptist,* is a conception full of simple and winning grace. Some of the largest easel-compositions of this artist at present adorn the gallery of the Louvre; among those in the antechamber are the *Coronation of the Virgin,* and the *Miracles of St. Dominico.* One supreme aim pervades all the creations of F.—that of arousing lofty devotional feeling through the contemplation of the beautiful in art.

FIFE, n. *fīf* [Ger. *pfeife;* It. *piffaro,* F. *fifre,* a fife; imitative of a shrill note]: a small flute with one key; a kind of pipe. V. to play on the fife. **Fi'fing**, imp. **Fifed**, pp. *fīft.* **Fi'fer**, n. one who.—The *Fife* is an ancient wind-instrument of military music,in which the melody is produced by blowing through a hole in a reed or tube, while the escape of air is regulated by the fingers stopping or opening a number of other holes in different parts of the pipe. It has a compass of two octaves, from D on the fourth line of the treble clef to D above in altissimo. The fife figures in the sculptured memorials of the Argonautic expedition, and from that time to this has maintained its place as a simple yet effective instrument for martial purposes It was common with English troops till the reign of James I., but was then discontinued; to be re-introduced by the Duke of Cumberland at the siege of Maestricht 1747. It is a universal favorite in the navy. Drums and fifes supply a simple but stirring music.

FIFE-NESS. *fīf-nĕs':* promontory of Scotland, eastmost point of Fifeshire; lat. 56° 17′ n., and long. 2° 35′ w. A mile n n.e., in the sea, is the dangerous Carr Reef, where a lightship was moored 1886. F.-N. is in view of the Isle of May and Bell Rock lights. In the Ness, trap rocks jut through the carboniferous strata, and the rocks contain small caves.

FIFESHIRE, *fīf'shėr:* maritime, almost peninsular county of the e. of Scotland, between the Firth of Forth on the south and the Firth of Tay on the north. It is 41½ m. in extreme length from n.e. to s.w., and 21 at its greatest breadth, 513 sq. m.; coast-line, 100 m., mostly rocky, and having many small ports. The surface is a succession or cultivated vales and hills. The hills rise in the West Lomond, 1713 ft., and Largo Law, 965. The chief rivers are the Tay, Forth, Eden (30 m. long), and Leven (16 m.). F. rests on old red sandstone, with trap rocks in the north, and carboniferous strata, with trap, in the south. There are many coal and iron mines, and lime quarries. The climate is dry, healthful, and mild on the Forth; but the valleys in the n. are much exposed to the full sweep of e. and n.e. gales. The soil is a rich loam, or wet clay on till. The Howe of Fife, on the Eden, is mostly sandy and gravelly, and not very productive. In 1880 the total acreage under all kinds of crops, bare fallow, and grass, was 246,480 acres; under corn crops, 86,584; under green crops, 47,179; clover, sanfoin, and grasses under rotation, 62,033. The total number of cattle reported the same year was 39,674; sheep, 72,873; pigs, 5,229; horses used for agriculture, etc., 10,202. F. has a greater number of proprietors, gentlemen's seats, and plantations, in proportion to its size, than any other Scotch county, and its coasts are thickly studded with towns and villages. The chief manufactures are linen, floor-cloth, and malt liquors. F. has 61 parishes. Pop. (1881) 171,960; (1901) 218,840. It returns one member to parliament. The chief towns are Cupar (county town), Dunfermline, St. Andrews, Kirkcaldy, East and West Anstruther, Burntisland, Crail, and Dysart. The ancient 'Kingdom of Fife' was the most cultivated, as well as the most warlike, of Scotch counties. It contains striking monastic, feudal, and palatial ruins of St. Andrews, Dunfermline, Falkland, and Lindores; many Celtic and Roman remains. Many of the events connected with the Scottish Reformation took place in this county, especially at St. Andrews.

FIFTEEN, a. *fĭf'tēn* [*five* and *ten* (see FIVE)]: five and ten. FIF'TEENTH, a. *-tēnth*, the fifth after the tenth; ordinal of 15; in *organs*, a stop tuned two octaves above the diapasons, its lowest C pipe being 2 ft. long. FIFTH, a. *fĭfth*, ordinal of 5; next after the fourth: N. one of five equal parts; in *music*, an interval of three tones and a semitone. FIFTH'LY, ad. *-lĭ*, in the fifth place. FIFTY, a. *fĭf'tĭ*, five times ten. FIF'TIETH, a. *-ĕth*, ordinal of 50. FIFTH-WHEEL, a wheel or segment above the fore axle of a carriage and beneath the bed.

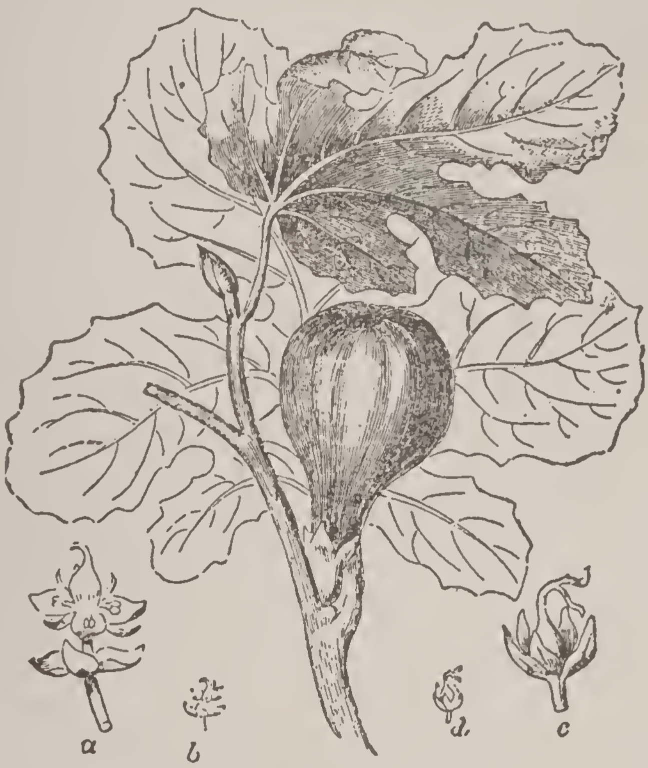
FIFTH MON'ARCHY MEN: religious sect in England, holding to one strange form of opinion which the religious and political fermentation of the 17th c. brought to the surface of society, and embodied in sects. The date which has been assigned to their first appearance is 1654. Notwithstanding the ridicule with which they have often been overwhelmed, there seems nothing in their tenets more objectionable than in those of many other sects of the period; and there is no reason to believe that the practices of their leaders exceeded in absurdity, or equalled in impiety, those of Robbins, Reeve, Muggleton, and other apostles of the Ranters. In common with most persons who hold the literal rather than the spiritual interpretation of prophecy, they believed in the four great monarchies of Antichrist marked out by the prophet Daniel; and quite consistently with Christian orthodoxy, they added to them a *fifth*—viz., the kingdom of Christ on earth. So far, there was nothing peculiar in their views. But their error was twofold. 1*st*. They believed in the immediate, or at least in the proximate, advent of Christ (a tenet common to them with the early church); and 2*d*. They held that the fulfillment of God's promise to this effect must be realized by the forcible destruction of the kingdom of Antichrist. Every obstacle which opposed itself to the setting up the Messiah's throne was to be thrown down, and what these obstacles were was a question for the solution of which the only criterion which presented itself was their own fanatical prejudices. It is obvious that such doctrines in such times must have given rise to practical as well as speculative disorder. The sect, never very numerous, became extinct shortly after the Restoration; a fact which, by depriving them of exponents of their own body, has probably exposed them to misrepresentation (Marsden's *History of the later Puritans*, p. 387). In politics, the Fifth Monarchy Men were republicans of the extremest section; and when their conspiracy to murder the Protector, Cromwell, and revolutionize the government, was discovered 1657, their leaders, Venner, Grey, Hopkins, etc., were imprisoned in the Gate House till after the Protector's death. Among their arms and ammunition which was seized, was found a standard exhibiting a lion couchant, supposed to represent the lion of the tribe of Judah, with the motto 'Who will rouse him up?'—Neal's *Puritans*, IV. 186. See also Carlyle's *Cromwell's Letters and Speeches*, III. 31.

FIG, n. *fĭg* [F. *figue*—from L. *fīcŭs*, a fig: AS. *fic;* Ger. *feige;* It. *fico*, a fig]: a well-known fruit of a pear-like shape; the tree *Fīcus Cārĭcă* (see below): something of little value or worthless; a snap of the fingers with the arm upraised as a mark of contempt: V. to give a snap of the fingers to or toward. FIG′GING, imp. FIGGED, pp. *fĭgd.* FIG-EATER, same as BECOFICO (q.v.). FIG-MARIGOLD, in *bot.*, common name for the species of the genus *Mesembryanthemum*, belonging to the family *Ficoideæ.* FIG-PECKER, same as FIG-EATER. FIG-SHELL, in *conch.*, a popular name for *Pyrula*, genus of sub-tropical shells, which have a fig- or pear-shaped form with a short spire. They have a wide, sub-tropical range. Forty species have been described, living at a depth of 17 to 35 fathoms. FULL FIG, in *familiar language*, in full dress. A FIG FOR YOU, care nothing for you; contemn and despise you: see FICO. FIG. contr. for FIGURE.

FIG (*Ficus*): genus of trees and shrubs belonging to the nat. ord. *Moraceæ*, and distinguished by having the flowers—male and female mixed—within an almost closed top-shaped, fleshy, receptacle, which enlarges to form the fruit, and incloses numerous one-seeded carpels, inbedded in its pulp. There are more than 100 species, some of them very large trees. Almost all belong to tropical and sub-tropical countries, of the vegetation of which they often form an important feature. They abound in India, in every jungle and hilly situation, to the most northern Himalaya, and some of them are cultivated about every village. Both *F. religiosa* (the Peepul) and *F. Rumphii* are held in veneration by the Hindus. The most notable species are the Common Fig (see below); the Banyan (q.v.); the Peepul (q.v.), Bo Tree, or Sacred Fig of India; the Sycamore (q.v.); and the East Indian Caoutchouc (q.v.) Tree. The leaves of some species are entire, those of others lobed. Several species of fig show the character for which the banyan in particular has become celebrated, of sending roots straight down to the ground from their spreading branches, and thus multiplying the apparent stems, by which a vast canopy of branches and foliage is supported. The E. Indian Caoutchouc or India-rubber Tree is remarkable for the exposure of its roots, which appear in masses above ground, extending on all sides from the base like great writhing snakes. Some figs are creeping or trailing shrubs, with slender stems, covering heaps of stones, or ascending trees like ivy.—Besides the Common Fig, many species yield edible fruits, though none of them are nearly equal to it in value. Among them are the Peepul (*F. religiosa*), *F. Benjamina*, *F. pumila*, *F. auriculata*, *F. Rumphii*, *F. Bengalensis*, *F. aspera*, *F. racemosa*, and *F. granatum*, all E. Indian, also the Sycamore of Egypt.—The milky juice of some species is bland and abundant, as of *F. Saussureana*, which has therefore been ranked among Cow-trees. In other species, the milky juice is very acrid. That of the Common Fig produces a burning sensation on the tongue. That of *F. toxicaria*, native of the Malayan islands, is used for poisoning arrows.—LAC (q.v.) is gathered from some species.

—The leaves of *F. politoria* are so rough that they are used for polishing wood and ivory in India. The juice of the fruit of *F. tinctoria* is used in Tahiti to dye cloth: the color is at first green, but being acted on by the juice of a *Cordia*, it becomes bright red. The bark supplies cordage, of which fishing-nets are made.

The Common Fig (*Ficus Carica*) is a native of the East, as the specific name *Carica* (from *Caria*) imports; but it is now cultivated throughout the south of Europe, and is even found naturalized there. Its cultivation has extended also to many warm countries. In the United States, it is seldom seen further n. than Philadelphia; and it is not sufficiently hardy to be common in Britain, though even in Scotland figs may occasionally be seen ripened on a wall; and in the south of England fig-trees are sometimes grown as standards, and a few small fig orchards exist. Protection is always given in some way during winter. Near Paris, and in some other parts of the continent of Europe, fig-trees are so trained that the branches can be tied in bundles and laid along the ground, when they are covered with litter and earth. The fig is a low deciduous tree or shrub, with large deeply lobed leaves, which are rough above, and downy beneath. The branches are clothed with short hairs, and the bark is greenish. The fruit is produced singly in the axils of the leaves, is pear shaped, and has a very short stalk; the color in some varieties is bluish-black; in others, red, purple, yellow, green, or white. The varieties in cultivation are numerous. In warm climates, the fig yields two crops in the year—one from the older wood (midsum-



Common Fig (*Ficus Carica*):
a, male flower, magnified; *b*, male flower, natural size; *c*, female flower, magnified; *d*, female flower, natural size.

mer shoots of the preceding year), and a second from the young wood (spring shoots of the same year); but in colder regions the latter never comes to perfection. Fig-trees are propagated by seed, by suckers, etc.; very frequently by layers or by cuttings. Dried figs are an important article of food in the Levant; in more northern regions, they are used for dessert, or for medicinal purposes, being applied to gumboils and other sores, and also administered in pulmonary and nephritic affections, and to relieve habitual constipation. The pulp contains about 62 per cent. of a kind of sugar called *Sugar of Figs.* Figs are dried either in the sun or in ovens built for the purpose. Great quantities are annually exported from the Mediterranean. The best are mostly from Smyrna, and are known as *Turkey figs*, of which those called *Eleme* or *Elemi* are most highly esteemed. Figs of inferior quality are exported in considerable quantities in the form of *fig-cake*, pressed with almonds into cakes somewhat like small cheeses. In the Levant, Portugal, and the Canaries, a spirit is distilled from fermented figs.

FIGARO, n. *fē'gâ-rō':* dramatic character introduced on the Parisian stage 1785 by Beaumarchais (q.v.) in his *Barbier de Seville* and *Mariage de Figaro.* These plays, in which F., who coolly outwits every one, is first a barber and then a valet-de-chambre, secured for their author a brilliant reputation not only in France, but also in Germany, where many translations and adaptations of the pieces appeared. Mozart, Paesiello, and Rossini also made them the basis of classic operas. Since their publication, the character of F. has stood as a type of cunning, intrigue, and dexterity. After the restoration of the Bourbons, a French literary periodical, distinguished for satirical talent, assumed the name.

FIGEAC, *fē-zhâk':* town of France, dept. of Lot, in a valley surrounded by finely wooded hills on the right bank of the Sellé, 32 m. e.n.e. of Cahors. It is irregular, its streets are narrow, and badly planned, and its houses in general not well built; but the antiquity and quaintness of many of its buildings give it a picturesque and interesting appearance. It has two beautiful Gothic churches, one of them, that of St. Sauveur, has a choir of the 11th, a general superstructure of the 15th, and a modern front of the 19th c. F. owes its origin to a Benedictine monastery, founded by Pepin 755. It has some cotton manufactures, and a trade in wine and cattle. Pop. 5,600.

FIGHT, n. *fīt* [AS. *feoht:* Ger. *fechte*, a fight: Swiss, *fechten;* Dut. *vechten*, to struggle]: a battle; a combat: V. to contend for victory; to combat. FIGHT'ING, imp.: N contention; strife: ADJ. qualified for war; fit for battle FOUGHT, pt. and pp. *fawt*, did fight. FIGHT'ER, n. one who.—SYN. of 'fight, n.': action; conflict; engagement; contest; struggle; fray; affray; encounter; duel; warfare.

FIGHT'ING FISH (*Macropodus pugnax* or *Ctenops pugnax*): small fresh-water fish, of the family *Anabasidæ* (q.v.), native of the s.e. of Asia, particularly of Siam, where it is commonly kept as goldfishes are in western countries, but on account of its pugnacity, two of these creatures brought together, often rush immediately to combat, or it is even enough to introduce a looking-glass into the water, and the fish hastens to attack its own image. Fish-fights are a favorite amusement of the Siamese; the license to exhibit them yields considerable annual revenue; and an extraordinary amount of gambling takes place in connection with them; not merely money and property, but children and liberty being sometimes staked. The F. F. has the anal and dorsal fins prolonged into tapering points. When the fish is quiet, its colors are dull; but when it is excited, they glow with metallic splendor, and 'the projected gill-membrane, waving like a black frill around the throat, adds something of grotesqueness to the general appearance.'

FIGLINE, *fē-glē'nā,* or FIGHINE, *fē-ghē'nā:* town of central Italy, province of Florence, 15 m. s.e. from Florence, on the left bank of the Arno. It is surrounded by a rectangular wall, and is traversed by a fine street, through which passes the great road from Florence up the valley of the Arno. The silk of F. is the best in Tuscany. Pop. about 6,000.

FIGMENT, n. *fĭg'mĕnt* [L. *figmentum,* a figure, an image—from *fingo,* I form, I feign]: an invention; something feigned or imagined.

FIGO, n. *fī'gō:* for FIG, or FICO, which see.

FIGUEIRA, *fē-gā'ē-râ:* town of Portugal, province of Beira, at the mouth of the Mondego, 23 m. w. by s. from Coimbra. Its harbor is a small bay or estuary of the Mondego, and is safe, but difficult of access for large vessels. It carries, however, considerable trade. The chief exports are salt, wine, vinegar, oil, dried fruits, and oranges. The wine shipped from F. is known by the names of *Figueira* and *Bairrada Wine.* It is quite different both from port and from sherry. It is best when new, and does not bear keeping long. F. is much resorted to as a bathing-place. Pop. 6,000.

FIGUERAS, *fē-gā'râs:* town in the n.e. of Spain, near the French frontier, province of Gerona, in a fruitful district, 20 m. n.n.e. of the town of Gerona. Its streets are gloomy, but it has beautiful promenades. On a height near the town is the citadel of S. Fernando, strongest fortress of Spain, and the key of the Pyrenees on their s. side, with accommodation for 20,000 men. This fortress has been so frequently taken by the French, as to give rise to the saying among the Spaniards, that the citadel of S. Fernando, in time of peace, belongs to Spain, but in time of war to France. Pop. (1887) 11,912.

FIGUIER, *fe-gē-ā',* GUILLAUME LOUIS: 1819, Feb. 15—1894, Nov. 9; French chemist and author; b. Montpellier. He received a scientific education, took his degree in medicine 1841, and removed to Paris 1842. In 1846 he was appointed prof. in the school of pharmacy at Montpellier, 1850 received the degree of physical sciences, and 1853 became a fellow of the school of pharmacy at Paris. He has contributed numerous articles to the *Annals of Science, Journal of Pharmacy, Scientific Review, The Press,* and *France,* and published a large number of works, among them, *Exposition et Histoire des Principales Decouvertes Scientifiques Modernes,* 3 vols. (1851–53); *Histoire du Merveilleux dans les Temps Modernes,* 4 vols. (1859–60); *Vie des Savants Illustres depuis l'Antiquité jusqu au XIX*^{e} *Siècle* (1866); *Les Insectes* (1866); *Les Articulés* (1867); *Les Oiseaux* (1867); *Les Mammifères* (1868); *L'Homme primitif* (1869); *Les Races humaines* (1871): *Les Merveilles de l'Industrie* (1873–76): *Connais-toi toi-miême,* elements of physiology (1878), and a drama, *Les Six parties du Monde* (1878).

FIG'ULINE: see POTTER'S CLAY.

FIGURANT, n. mas. and FIGURANTE, n. fem. *fĭg'ū-rănt'* [F. *figurant,* part. of *figurer,* to make a figure]: one of the dancers in a ballet; one who dances in groups or figures, not coming forward alone, but serving to fill up the scene and form a background for the solo performers.

FIG'URATE NUM'BERS: in Arithmetic, a class of numbers or series of numbers, whose nature will be understood from the following table:

	1	2	3	4	5.	6	7	etc.
I.	1	3	6	10	15	21	28	etc.
II.	1	4	10	20	35	56	84	etc.
III.	1	5	15	35	70	126	210	etc.
		etc.				etc.		

The natural numbers are here taken as the basis, and the first order of figurate numbers is formed from the series by successive additions; thus, the 5th number of the first order is the sum of the first five neutral numbers. The second order is then formed from the first in the same way; and so on.

If instead of the series of natural numbers, whose difference is 1, we take series whose differences are 2, 3, 4, etc., we may form as many different sets of figurate numbers. Thus:

	1	3	5.	7	9.	etc.
I.	1	4	9	16	25	etc.
II.	1	5	14	30	55	etc.
III.	1	6	20	50	105	etc.
		etc.			etc.	

Or—

	1	4	7	10	13.	etc.
I.	1	5	12	22	35	etc.
II.	1	6	18	40	75	etc.
III.	1	7	25	65	140	etc.
		etc.			etc.	

The name *figurate* is derived from the fact that the simpler of them may be represented by arrangements of equally distant points, forming geometrical figures. The numbers belonging to the first orders received the general name of *polygonal,* and the special names of *triangular, square, pentagonal,* etc., according as the difference of the basis is

1, 2, 3, etc. Those of the second orders are called *pyramidal* numbers, and according to the difference of the basis, are triagonally, quadragonally, or pentagonally pyramidal. The polygonal numbers may be represented by points on a surface; the pyramidal by piles of balls.

The general formula for polygonal numbers, from which any particular one may by found by substituting the proper values for n and r is,

$$\frac{(r-2)\,n^2-(r-4)\,n}{2}$$

where $n =$ number of the term required, $r =$ the denomination (3 if triagonal, 5 if pentagonal, etc.).

FIGURE, n. *fĭg'ūr* or *fĭg'ėr* [F. *figure*—from L. *figūră*, shape, an image—from *fingo*, I form: It. *figura*]: shape; form; appearance; a character or shape denoting a number; a mode of expression; a type; an emblem; a diagram; the steps or movements in a dance; in *art*, a representation of the human body; in *rhet.*, mode of speaking in which words are turned from their ordinary sense—usually termed figure of speech; in *logic*, the arrangement of the middle term of a syllogism with the two terms of the conclusion; in *familiar language*, price or value: V. to shape or form; to represent; to make a figure. FIG'URING, imp. FIG'URED, pp. *-ėrd:* ADJ. adorned with figures or ornaments. FIGURED BASS, in *music*, a bass part with figures placed over the notes, which indicate the harmony to be played to each note, and serve as a guide to the accompanist, invented in the 17th c. by Ludovico Viadana. FIGURED COUNTERPOINT, in *music*, several notes of various lengths, with syncopations and other ornamental lengths set against the single notes of the canto fermo. FIGURED-MELODY, in *music*, the breaking up of the long notes of the church melodies into larger or more rapid figures or passages. FIG'URABLE, a. *-ū-ră-bl*, capable of being brought into a fixed shape. FIG'URABIL'ITY, n. *-bĭl'ĭ-tĭ*. FIG'URAL, a. *-răl*, pertaining to figures. FIGURATE, a. *fĭg'-ū-rāt*, of a certain and determinate form. FIGURATE NUMBERS (see below). FIG'URATELY, ad. *-lĭ*. FIG'URATIVE, a. *-ră-tĭv*, not real; representing something else; typical; abounding in figures or metaphors. FIG'URATIVELY, ad. *-lĭ*, in a sense different from the usual sense. FIG'URATIVENESS, n. GRAMMATICAL FIGURE: see METONYMY: SYNECDOCHE. RHETORICAL FIGURE: see METAPHOR. FIGUREHEAD, a carved ornament in human or other form at the prow or fore-part of a ship. FIGURE-STONE, a variety of talc or soapstone (see SOAPSTONE). TO CUT A FIGURE, to make a show; to attract attention.—SYN. of 'figure, n.': outline; structure; conformation; configuration; image; mold; fashion; metaphor; simile; similitude; representation; statue; drawing; pattern; design; conduct; career; a number; a digit; value; price; representative; a trope.

FIGWORT, n. *fĭg'wėrt* [*fig* and *wort*]: a wild roadside plant with small flowers; indigenous to N. America and Europe: the knotted figwort, formerly deemed a remedy for scrofula, is *Scrophulārĭă nodōsă*, ord. *Scrophulārĭācĕæ*.

FIJI, *fē'je* (or Feejee, or Viti, *vē'tē*) **ISLANDS**: archipelago of about 250 islands in the s. Pacific Ocean; lat. 15° 30'—20° 30' s., long. 177° e.—178° w.; total area 8,034 sq. m., almost equal to the area of Mass.: since 1874 a dependency of the British empire. The group was discovered 1646 by the Dutch navigator Tasman. The largest of the group, Viti-levu, or Big Viti, has 4,479 sq. m.; Vanua-levu, 2,486 sq. m.; and all the other islands together, have 1,069 sq. m. The islands are of volcanic origin, and though there are no longer any active volcanoes, yet hot springs, numerous earthquakes, and other signs testify that the subterranean forces are not quite extinct. All the islands are coral-girt; and to the approaching navigator appear clothed to their very summits with a dense and luxuriant vegetation. The surface is generally hilly, and the soil, owing to abundant rain, is very productive. The windward sides of the islands are covered with thick forests, while to the leeward is a grassy country dotted here and there with screw-pines The natural productions of Fiji or Viti are very varied, and the vegetation is, on the whole, tropical. The mountain districts are well adapted to the growth of coffee; rice can be grown in marshy land; the soil is well adapted for the sugar-cane, while cotton; tobacco, sweet potatoes, yams, arrow-root, maize, bread-fruit, plantain, the sago and cocoa palm, with other tropical productions, all thrive. These islands require only to be well worked by the capitalist to yield a golden harvest, as the coffee, cotton, and sugar industries are capable of extensive development. In 1880 there were at least seven sugar-mills at work, the product ranking well in the market. Of the plants yielding oil and fat, the most valuable is the cocoa-nut palm; the oil, copra, or dried nuts of which always command a good price. Each tree produces about 100 nuts, and is worth $1 to $1.50 a year to its proprietor. Edible roots are abundant, bread being made from them; but the yam is the staple article of food, by the ripening season of which the natives regulate their calendar. Timber suitable for house and ship building abounds. Copper, antimony, plumbago, and gold in small quantities have been found. Pearl fish exist in innumerable quantities near the coral-reefs, and fish and turtle are plentiful. There seem to be no indigenous animals; such live-stock as pigs, dogs, cattle, sheep, and fowls have been imported. The revenue of $530,986 (1882) was reduced to $315,491 (1887), and was only $315,987 (1889). The annual exports fluctuated 1877–87 from $826,200 to $1,705,860, and the annual imports from $1,511,460 to $3,897,720. These figures include the total foreign trade, much of which was carried on with other British colonies. The public expenditures (1889) were $286,705; imports $890,454; exports $1,832,113; public debt $1,287,900. The chief articles of export are sugar (increasing), copra, cotton (not increasing), fruit, maize, coffee, cocoa-nut fibre, candle-nuts; while the imports embrace Manchester goods, ironmongery, cutlery, wine, beer, spirits, groceries, etc. There are excellent harbors, among which that of Levuka, the largest town, situated on Ovalau, lately provided with a lighthouse, is most important. The capital is **Suva**, in the s. of Viti-levu.

The native inhabitants are for the most part Melanesians, with dark complexions and long frizzly hair; but considerable intermixture has taken place with the Polynesians of Tonga and Samoa, who have to some extent modified both the customs and language of the Fijians. They are tall, muscular, and well built, with regular features. They are very cleanly in their habits, and love the water. When first known by Europeans, they were in some respects civilized; but till lately human life was recklessly wasted, and nowhere was cannibalism so important an institution as here. The Fijians had priests, temples, a complex theology, and a firm belief in a future state. Human sacrifices were very common; and not merely enemies and strangers were slain to be eaten, but even wives, children, and friends were ruthlessly murdered and cooked. This state of things was in full force till about 1854. In 1835 the first Wesleyan missionaries landed on one of the Fiji Islands. Now, marvellous to relate, the bulk of the inhabitants are professing Christians, the only heathens being a few thousands in the interior of Viti-levu. Sir Arthur Gordon has declared that the Fijians are a Christian people. More than 102,000 are regular attendants at Wesleyan chapels; several thousands are Rom. Catholics; and other Christian churches have agencies here. The converts are said to be peaceable, well-behaved people. Cannibalism has disappeared since 1878; polygamy also has ceased; and peace seems everywhere to prevail. More than 800 churches have been built; and education is zealously promoted. Several interesting works on F. have lately been published, of which the more notable are *At Home in Fiji*, by Miss Gordon Cumming (1881); *A Year in Fiji*, by J. Horne (1881); and *Coral Lands*, by H. S. Cooper (1880).

The later history of Viti has been very tumultuous. In 1855, Thakombau, chief of Bau, was made responsible for a debt due from the natives to the Americans; and this resulted in his election to the dignity of 'Tui Viti,' or king of Viti. In 1857 he offered to cede Viti to Great Britain, in consideration of the payment of his debt to America, stipulating only for the retention of his title and authority over the natives. This offer was refused by the British government 1862, after sending out a deputation. A 'Polynesian Company' was then started, which undertook to clear off the debt, in return for certain valuable privileges, but ultimately collapsed. In 1869 the pres. of the United States refused the protectorate of the islands. From that date till 1873, the government sanctioned three or four unsuccessful constitutions. The cession of the islands to Britain was renewed 1873, and accepted, and 1874, Sep. 30, they were annexed as a crown colony. The small island of Rotumah (q.v.), annexed by Britain 1880, is now attached to the F. group.

The pop. (1871) was estimated 146,000, but an epidemic of measles introduced by a British man-of-war reduced that number by at least one-third 1875; (1881) natives 115,635, whites 2,293, Polynesian laborers 6,318, inhabitants of Rotumah (annexed 1881) 2,500; (1901) 117,870 of all classes; revenue £113,853, expenditure £104,973, debt £196,095, imports £351,182, exports £548,805.

FILADELFIA, *fē-lâ-dĕl' fē-â:* town of s. Italy, province of Catanzaro, 18 m. w.s.w. from Catanzaro, on the w. side of the Apennines, and on a branch of the Angistola. Pop. 5,700.

FILAGO, n. *fī-lā'gō* [L. *filum*, a thread: from the delicate threads or *fila* which cover the plant]: in *bot.*, cudwort, genus of composite plants, chiefly annuals.

FILAMENT, n. *fĭl'ă-mĕnt* [F. *filament;* OF. *filamens*, a filament—from mid. L. *filamĕn'tum*—from L. *filum*, a thread: It. *filo;* F. *fil*, a thread]: a thread; a fibre; in *bot.*, the stalk which supports the anther. Fila'ceous, a. *-ā'shŭs*, consisting of threads; composed of threads or thread-like fibres. Fil'amen'tous, a. *-mĕn'tŭs*, thread-like; bearing filaments. Fil'amen'tary, a. *-tėr-ĭ*, formed by filaments. Filamen'toid, having the appearance of a filament; like a filament. Fil'atory, n. *-ter-ĭ*, a machine which spins thread. Fil'iform, a. *-ĭ-fawrm* [L. *forma*, shape]: slender like a thread. Filature, n. *fĭl'ă-tūr*, spinning, especially of silk from the cocoon. Filar, a. *fī'lėr*, of or pertaining to a thread: specifically applied to a micrometer, microscope, etc., having threads or wires across its field of view. Filose, a. *fī'lōs*, ending in a thread-like process.

FILANDER, n. *fĭ-lăn'dėr* [L. *filum*, a thread: from the slenderness of the tail]: species of short-tailed kangaroo (q.v.).

FILA'RIA: see Guinea-worm: Thread-worm.

FILBERT, n. *fĭl'bėrt* [corruption of *fill-beard*, a kind of nut which just fills the cup made by the beards of the calyx, the ordinary hazel projecting beyond the beard]: fruit of the cultivated hazel; a variety of the *Cŏrylŭs avĕllānă*, ord. *Cupŭlĭfĕræ*, or *Corylācĕæ:* see Hazel. *Note.*—A more likely origin is after *St. Philibert*, whose day is August 22, old style, the proper season for nuts—see Skeat.

FILCH, v. *fĭlch* [Swiss, *flöke*, to bear away secretly: Norw. *pilka;* Scot. *pilk*, to pick: Gael. *peallaid*, the skin of an animal (see Pilch)]: to steal something of little value; to pilfer. Filch'ing, imp.: N. the act of stealing in a petty way. Filched, pp. *fĭlcht.* Filch'er, n. one who. Filch'ingly, ad. *-lĭ.* *Note.*—Skeat prefers the derivation of *filch* from Icel. *fela*, to hide, to conceal: Goth. *filhan*, to hide, to bury.

FILE, n. *fīl* [F. *fil*, a thread: OF. *file*, a rank, a row—from mid. L. *fila*, a string of things—from L. *fĭlŭm*, a thread]: a line of wire on which papers are strung for preservation and reference; the number of papers so strung; a bundle of papers tied and titled: a row of soldiers ranged one behind another, as *rank* means a row of men ranged one beside another; but, generally speaking, two soldiers, the front and rear rank man, as in the ordinary formation at the present day a battalion stands two deep: the term is applied sometimes to one man in a single rank: a row; a series; a list: V. to range along a thread or string; to fasten together, as paper on a wire for preservation; to place officially among the records of a court. Fi′ling, imp. placing on a string or in a bundle, as papers; marching in file, as soldiers. Filed, pp. *fīld*. To march in file, to follow one after another, and not abreast. Rank and file, the body of private soldiers composing an army. File-firing, firing guns by one file at a time.

FILE, n. *fīl* [Dut. *vijl;* Dan *fül;* Sw. *fil*, a file: O.H.G. *figila*—from *figen*, to rub: Bohem. *pila*, a saw—from *piliti*, to saw]: a well-known steel tool with a toothed or ridged surface for reducing, smoothing, or cutting any article, generally an article of metal: V. to rub or smooth with a file; to wear off by friction. Fi′ling, imp. Filed, pp. *fīld*, worked by the file; polished. Fi′ler, n. one who. File-blank, piece of soft steel, shaped and ground ready for cutting, to form a file. File-carrier, tool-holder used to mount a file. File-cleaner, scratch-brush of wire for cleaning files. File-cutter, one who makes files. File-fish, same as Balistes (q.v.). File-shell, in *conch.*, bivalve mollusk of the genus *Pholas*. File-stripper, machine for smoothing a worn-out file, preparatory to re-cutting. Fi′lings, n. plu. *-lĭngz*, particles rubbed off with a file.

FILE, n. *fīl* [Gael. *file*, a bard, a poet—in the sense of an accomplished clever person (see File 2)]: in *OE.* and *modern slang*, an odd fellow; a clever person; a cheat.

FILE, v. *fīl* [contr. of *defile*, which see]: in *OE.*, to defile. Fil′ing, imp. Filed, pp. *fīld*, defiled; polluted.

FILE—FILING: a tool for rasping:—the act of applying it. A File is a steel tool, having its surface covered with teeth or serratures, and used for cutting down and shaping metals and other hard substances. There is little doubt that in the earliest stages of metal-working, when bronze implements first superseded those of stone, rough stones were used for the purposes to which files are now applied; nevertheless, the use of files dates from high antiquity. They are mentioned in the Old Testament, I. Sam. xiii. 21; also in the *Odyssey*. Files are of almost every conceivable shape, to suit the very varied purposes to which they are applied—flat, square, round or *rat-tail*, triangular, half-round, feather-edged, etc., besides being variously bent for intricate work. Nearly all these files are made thicker in the middle, or 'bellied,' the object of which will appear below. Files require to be made of the very best steel, which is first forged into the required shape, known as a 'blank,' then finished more accurately to the required form by grinding, planing, or filing. The blanks thus prepared and well softened (see TEMPERING) are next handed to the cutter, who sits astride on a low bench or stool, and has before him a stone anvil, with a flat piece of pewter laid upon it. The blank is held upon the anvil, with its tang toward the cutter, by means of a long loop of leather-strap, into which the cutter places his foot. He then cuts the teeth by striking with a hammer a short stout chisel, held obliquely at an angle of about 12° or 14° from the perpendicular. The object of this will be easily understood; for, if the chisel were perpendicular, a furrow like the letter V would be indented, and an equal burr struck up on each side; but instead of this, a cutting tooth like that of a saw, but with less obliquity, is required; this is effected by the obliquity of the chisel, and a burr is thrown up on one side only—viz., toward the tang. The surprising regularity observable in the distance between the teeth is secured in this way: The cutting is commenced at the point of the file; the chisel is then drawn backward, laid upon the blank, and slid forward, till it reaches the burr raised by the last cut; the blow is now struck, and another tooth and burr produced, which serves as a guide for the next cut; and so on. The distance between the teeth thus depends on the force of the blow and the obliquity of the cut; for the heavier the blow, the greater the ridge or burr, and the obliquity determines the distance of the cut from the burr; the skill of the workman consists, therefore, in the precise regulation of the blows. Most files are double cut—that is, they have two series of *courses* of chisel-cuts, which are oppositely inclined at an angle of about 55° to the central line of the file. The second course is made in the same manner as the first, but with lighter blows, and is usually somewhat finer than the first. This angular crossing converts the ridges into pointed teeth. Files used for soft metals which are liable to clog the teeth are single cut—that is, they have but one course of cuts. Taper files have the teeth finer toward the point. Rasps for wood are cut with pointed chisels; each tooth being an angular pit with a strong burr, instead of a long furrow. The newly cut teeth in the soft steel are preserved from injury by being laid upon the softer pewter block before referred to. The rapidity with which the blows are struck varies with the fineness of the file; 60 or 80 cuts are commonly made per minute.

Files have to be very carefully hardened and tempered. If heated too strongly, or made too hard, the steel is so brittle that the teeth tear off; if too soft, they wear down rapidly, and the file soon becomes useless. Great care is required also in keeping them straight, as the sudden cooling necessary for hardening is very apt to warp the steel. At first sight, it would appear, from the simplicity and continual repetition of the movements required in file-cutting, and the precision and regularity of the work, that it is an operation specially adapted for machinery. Many attempts have been made to cut files by machinery, but with only partial success; the chief difficulty arises from the necessity of modifying the force of the blow to suit the hardness of the steel. It is practically impossible to supply a large number of blanks all of exactly the same hardness; and if the machine be adjusted to suit the hardness of one blank, it may strike too heavy or too light a blow for the next; whereas the workman *feels* at once the hardness of the steel he is working upon, and adjusts his blows accordingly.

Filing, to the uninitiated, may seem a simple operation of rubbing one piece of metal on another, requiring only muscular strength and no skill. This is far from being the case, for a skilful workman will, in a given time, with a given amount of muscular work, cut away a far greater quantity of metal with a file than one who is unskilful, for he makes every tooth *cut into* the work, instead of *rubbing over* it. To do this he must adapt the pressure and velocity of motion of the file to the coarseness of its teeth, and the hardness, brittleness, and toughness of the material he is working upon. To *file flat,* that is, to avoid rounding the sharp edges of a narrow piece of work, is very difficult, and some years of continual practice, are required before an apprentice can do this well, especially in 'smoothing up' or finishing work before polishing, and there are some who never succeed in filing, smoothing, and polishing without rounding the edges of fine work. The power of doing this constitutes the main test of skill among mathematical instrument makers and other metal-workers. The flattest surface can be obtained by laying the work, where its form admits, upon a piece of cork held in the vice, and filing it with *one hand,* the pressure on the file being communicated by the forefinger. It is mainly to aid the workman in filing flat that the rounded or bellied form is given to files: this partially compensates the tendency of the hands to move in a curved line with its convexity upward when they move forward and apply pressure, as in the act of filing.

FILE-FISH, see Balistes.

FILEY, *fī'lĭ:* watering-place on the Yorkshire coast, England, eight m. s.e. of Scarborough. A promontory shelters the bay from n. winds; and F. has been recommended as a good place for a great harbor of refuge. Pop. (1881) 2,337.

FILIAL, a. *fĭl'-ĭ-ăl* [F. *filial*—from mid. L. *fĭlĭālĭs*—from L. *filĭŭs*, a son, *filĭă*, a daughter], pert. to a son or daughter. Fil'ially, ad. *-lĭ*. Filiation, n. *fĭl'ĭ-ā'shŭn* [F.—L.]: relation of a child to a father; correlative of paternity; the act of ascribing a child to a father; affiliation: in the *law of Scotland,* process by which the paternity of a child is determined. The general rule that the father is he whom the marriage points out (*pater est quem nuptiæ demonstrant*), is a presumption which may be overcome by showing its impossibility in fact in the specific case. See Evidence: Semiplena Probatio. Fili'ety, *-ī'ĭ-tĭ*, sonship.

FILIBUSTER, or Fillibuster, n. *fĭl'ĭ-bŭs'tėr* [F. *flibustier*, a freebooter: Sp. *filibuster*]: one who unites with others in attacking a foreign country in time of peace for plunder or conquest; a marauder; a freebooter—see *Note* under Free. F.—meaning a sort of piratical adventurer, but acting sometimes under a pretense of seeking some public good—may be regarded as the modern designation, especially in the United States, for one of the class known formerly as *Buccaneers* (q.v.). *Note.*—Filibuster is said to be from the Sp. *filibote*, or *flibóte*, a fly-boat, which the Spaniards adopted from the Eng. *fly-boat*, of which it is a mere corruption.

FILICAJA, *fē-lē-kâ'yâ*, Vincenzo: 1642–1707, Sep. 24; b. Florence, of an ancient but impoverished family: lyrical poet. A disappointment in love, in his youth, led him to turn from amatory poetry to heroic, martial, and sacred themes. These odes, published in Florence 1684, made him famous, and procured for him the liberal patronage of Queen Christina of Sweden. Patriotic sonnets—grandest among which is his lament over Italy—*Italia, Italia, O tu cui feo la sorte*—and heroic odes, severely classic in form, are the chief works of Filicaja. In advanced age, he was appointed judge and senator, and 1702 was called to one of the highest magisterial offices in Florence, where he died. His works, under the title of *Poesie Toscane di Vincenzo da Filicaja, Senatore Fiorentino e Accademico della Crusca*, were published after his death. The best edition is that of Venice (2 vols. 1762), containing both the Italian and Latin verses of the author.

FILICES, n. plu. *fĭl'ĭ-sēz* [L. *filix*, a fern, *filĭcēs*, ferns]. the fern-tribe (see Ferns). Fil'ical, a. *-kal*, of or pertaining to the Filices, or Ferns: as the *Filical* Alliance. Filica'les, *-kā'lēz*, an alliance of Acrogens, containing the Ferns. Fil'icoid, a. *-koyd* [Gr. *eidos*, form]: resembling a fern. Filicites, n. plu. *fĭl'ĭ-sītz* or *fĭl'ĭ-sī'tēz*, fossil ferns. Filicic acid, the dibutyric ether of phoroglucin.

FILIFORM, a.: see Filament.

FILIFORMIA, n. *fĭl-ĭ-fawr'mĭ-a:* in *zool.*, one of the two sections of crustaceans into which the order *Læmodipodia* is divided. They are distinguished by their long threadlike body and slender legs.

FILIGREE, n. *fĭl'ĭ-grē* [F. *filigrane*—from It. and Sp. *filigrana*, a kind of texture made of gold or silver wire—from *filo*, wire; *grano* the direction of fibres of wood: L. *fīlŭm*, a thread, *grānum*, a grain]: very fine ornamental threadlike work made of gold or silver wire, which is twisted into spirals and other convoluted forms; and these spirals, etc., are combined to form a sort of metallic lacework, which is shaped into brooches, earrings, crosses, head ornaments, and others of a very light and elegant character. This work is chiefly done in Malta, India, Genoa, the Ionian Islands, and some parts of Turkey. It sometimes receives the general name of *Maltese work.*—F. work is of great antiquity: it has been found in the tombs of Thebes; and specimens of Greek and Etruscan work, 3,000 years old show perfect execution. The art was highly developed in central Asia also from the most remote times. The Irish F. work reached its perfection in the 10th and 11th c.: beautiful specimens are in the Royal Irish Acad. at Dublin, and the 'Tara Brooch' is well known. FILIGREE, in *sculp.*, fine threadlike work. FILIGREED, a. ornamented with filigree.

Filigree Ornaments.
From a drawing by M. Mariana, in the Florence Exhibition (1861)

FILIOQUE, *fĭl-ĭ-ō'kwē* (in English 'and from the Son'): an addition to the original statement of the Nicene Creed. The first general council (at Nicæa 325), called with special reference to the controversy concerning the divinity of Christ, naturally gave that subject its chief attention. Consequently the creed that it adopted, while declaring the Son to be of one substance with the Father, simply affirmed faith also in the Holy Spirit without attempting to define his essential being. But subsequently earnest discussions concerning the Holy Spirit were greatly multiplied and prepared the way for his being described by the second general council (at Constantinople 381) as the Spirit 'proceeding from the Father.' These words of Christ were assumed to refer to the Spirit's essential being and consequently to teach that the source of that is in the Father only. Though this was the prevailing view in the Greek Church, among the Latins the tendency was to say that the Spirit's proceeding or issuing forth is also from the Son. This, Augustin affirmed, and by his great influence, did much to establish. At length, 589, the synod of Toledo (not a general council) added the words 'filioque' to the creed. This addition pope Leo III. in 809, against the arguments and entreaties of Charlemagne refused to sanction though he affirmed the doctrine sound and Scriptural. When, two centuries later (1014), the papal assent was yielded the addition was not made in writing, but was chanted during high mass at the coronation of Henry II. In the Eastern Church the clause was rejected, though some eminent men admitted that the procession of the Spirit from the Father is through the Son. After the schism between the East and the West (accomplished in the 11th c. and of which the doctrinal difference expressed by the addition of 'filioque' to the creed was one of the causes), repeated efforts to effect a reconciliation were made without success. Yet both churches profess belief in the existence and divinity of the Holy Spirit, and, on that subject, differ from each other only in their attempts to express mysteries concerning which all human minds are equally ignorant. Since the Reformation, Protestant churches accept the creed with 'filioque' retained. They who would rightly estimate this controversy must bear in mind that the words on which it is founded, 'who proceedeth from the Father' are understood by many as referring only to the mission of the Spirit among men and consequently as not revealing anything concerning the essential relation of the Spirit to the Father or the Son.

FILIPEN'DULOUS, a.: hanging or suspended by a thread; in *bot.*, seemingly suspended by or strung on a thread; applied to tuberous swellings in the middle or at the extremities of slender thread-like rootlets.

FILIPO-D'ARGIRO, *fē-lĭp'pō-dâr-jē'rō*, San: town of Sicily, province of Catania, about 30 m. w.n.w. of the town of Catania; on the right bank of the Traina, in an exceedingly fertile district. It contains a ruined Saracenic castle, and several religious edifices. Saffron of good quality, and in considerable quantity, is grown in the vicinity. San F. stands on the site of the ancient Sikelian city of Agyrium, birthplace of Diodorus Siculus, and which, about B.C. 400, is said to have had 20,000 citizens. Present pop. 12,000.

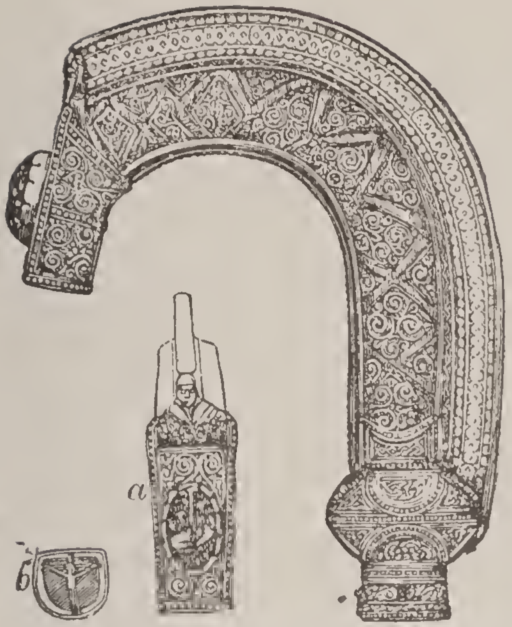
FILITELÆ, n. *fĭl-ĭ-tē'lē* [L. *filum*, a thread; *tela*, a web]: tribe of spiders noted for the construction of their web.

FILL, v. *fĭl* [AS. *fyllan*, to replenish: Icel. *fylla;* Ger. *füllen*, to fill: Lith. *pillu*, to pour into]: to put or pour in all that can be held; to crowd; to stuff; to content or satisfy; to hold or occupy, as any post or office; to supply the holder of the office; to engage or employ as time; to become full: N. as much as satisfies fully. Fill'ing, imp.: Adj. causing fulness or satiety: N. act of making full; act of growing full. Filled, pp. *fĭld*. Fill'er, n. one who, or that which. To fill full, to fill completely; to surfeit. To fill up, to fill to the brim or entirely; to complete; to grow or become quite full; to occupy the whole space. To fill out, to enlarge.

FILLAGREE: see Filigree.

FILLAN, *fĭl'lan* Saint, or Saint Faolan (surnamed

PLATE 18.



Fillan, St.—Fig 2. Silver Case of the Quigrich: *a*, Front part; *b*, Terminal plate.

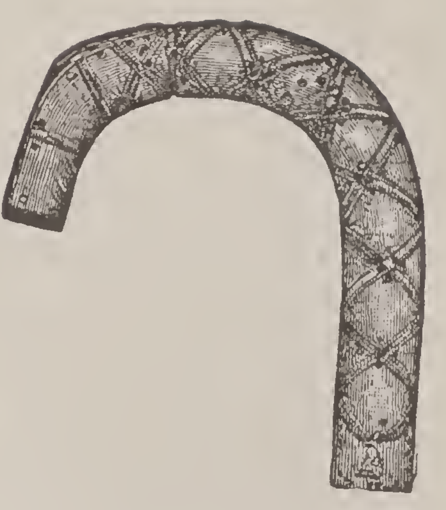
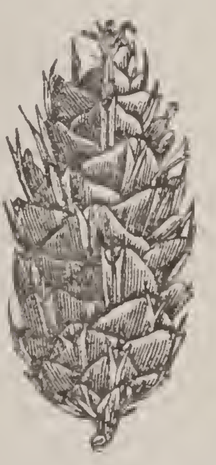
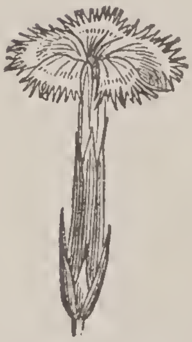


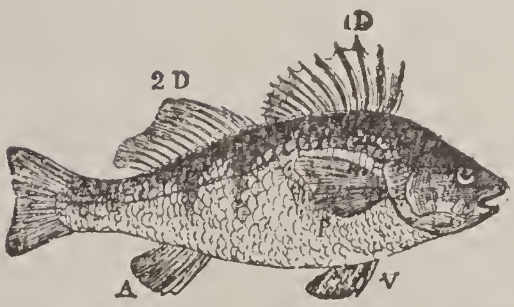
Fig. 1.—Quigrich of St. **Fillan.**



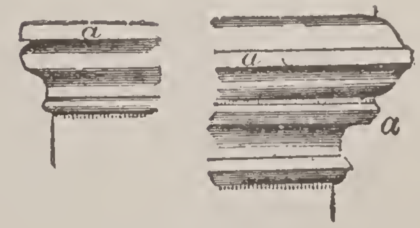
Cone of Douglas **Fir** (*Abies Douglasii*).



Fimbriate Petals (*Dianthus caryophyllus*).



Fin.—Common Perch (*Perca fluviatilis*): 1 D, First dorsal; 2 D, Second dorsal; P, Pectoral; V, Ventral; A, Anal; C, Caudal.



a, *a*, *a*, **Fillets.**

the Leper): a Scoto-Irish ecclesiastic, whose yearly festival is on June 20. His chief church in Scotland was at the e. end of Loch Erne, in Perthshire, where 'St. Fillan's Well' was long believed to have supernatural powers of healing. A seat in the rock of Dunfillan still keeps the name of 'St. Fillan's Chair;' and two cavities beside it are said to have been hollowed by St. F.'s knees in prayer. His Irish church is Ballyheyland (anciently called Killhelan or Kill Faelain), in the barony of Cullenagh, in Queen's county.

FILLAN, Saint, the Abbot: Scoto-Irish saint of the 8th c.; son of St. Kentigerna of Inchcaileach, in Loch Lomond. His yearly festival is on Jan. 7 or 9. He joined the monastery of St. Mund on the Holy Loch, and after that saint's death succeeded him as abbot. His chief church in Scotland was in Perthshire, in the upper part of Glendochart, which takes from him the name of Strathfillan. Here, a well-endowed priory, dedicated in his honor, was repaired or rebuilt in the beginning of the 14th c. King Robert Bruce made a grant of money to the work, in gratitude, probably, for the miraculous encouragement which he was said to have received on the eve of Bannockburn from a relic of the saint—one of his arm-bones enclosed in a silver case. Another relic of St. F.—the silver head of his crosier, or pastoral staff—has been preserved to our time. It is called the 'Coygerach' or 'Quigrich,' and appears in record as early as 1428, when it was in the hereditary keeping of a family named Jore or Dewar, believed to have been its keepers from the time of King Robert Bruce. They had half a bowl of meal yearly from every parishoner of Glendochart who held a merk land, and smaller quantities from smaller tenants; and they were bound, in return to follow the stolen cattle of the parishoners wherever their traces could be found within the realm of Scotland. The Quigrich, besides its virtues in the detection of theft, was venerated also for its miraculous powers of healing. In 1487, the right of keeping it was confirmed to Malice Doire or Dewar by King James III. in a charter which was presented for registration among the public records of Scotland so lately as 1734. Sixty years later, the Quigrich still commanded reverence, but its healing virtues were tried only on cattle, and its once opulent keepers had fallen to the rank of farm-laborers. It was publicly exhibited in Edinburgh 1818, before being carried to Canada by its hereditary keeper Archibald Dewar. His son, Alexander Dewar, desirous that it should be restored to Scotland, came to an arrangement whereby, partly by purchase and partly by gift, it became the property of the Soc. of Antiquaries of Scotland. It was described by Dr. Daniel Wilson in a paper in the *Canadian Journal*, No. xxiv., reprinted as *The Quigrich, or Crosier of St. Fillan* (Toronto, 1859); see also *Historical Notices of St Fillan's Crosier* by Dr. Stuart, reprinted from the *Proceedings of the Society of Antiquaries of Scotland*, vol. xii. (1877). A linn in the river Fillan or Dochart, in Strathfilan was long believed to work wonderful cures on insane persons, who were immersed in the stream at sunset, and left bound hand and foot till sunrise in the ruins of the neighboring church of St. Fillan.

FILLET, n. *fĭl'lĕt* [F *filet*, dim. of *fil*, a thread—from L. *fīlŭm*, a thread]: a little band, such as may be put round the head; in *arch.*, a small space or band like a narrow ribbon, used with moldings; a narrow ornament or molding; in *her.*, an ordinary which, according to Guillim, contains the fourth part of the chief; in *dairy*, perforated curb to confine the curds in making cheese; in *die-sinking*, ribbon of metal of gauged proportions fed to the machine which punches out the planchets for coining; in *gilding*, band of gold-leaf on a picture-frame or elsewhere; in *mach.*, the thread of a screw; in *manége*, the loins of a horse, beginning at the place where the back part of the saddle rests: V. to bind with a little band; in *arch.*, to adorn with a band or astragal. FIL'LETING, imp. FIL'LETED, pp. FILLET, n. [F. *filet*, the band of flesh which lies along under the backbone of an animal]: a boneless lump of flesh bound together by a fillet or bandage; the fleshy part of the thigh in veal.

FILLIBEG, or PHILIBEG, n. *fĭl'ĭ-bĕg* [Gael. *filleadh*, plait or fold; *beg*, little]: the kilt of the Highlanders of Scotland, reaching nearly to the knees. *Note.*—The *sporran* is the pouch in front of the kilt.

FIL'LIBUSTERS: see FILIBUSTER.

FILLIP, n. *fĭl'lĭp* [an imitation of the sound: from FLIP]: a stroke with the finger-nail suddenly let go from the thumb: V. to strike smartly with the finger suddenly thrown outward from its bent position inward to the thumb. FIL'LIPING, imp. FIL'LIPED, pp. *-lĭpt*.

FILLIPEEN: see PHILOPENA.

FILLISTER, n. *fĭl'ĭs-tėr:* in *carp.*, rabbet on the outer edge of a sash-bar, to hold the glass and the putty; plane for making a rabbet.

FILLMORE, *fĭl'mōr*, MILLARD: President of the United States; 1800, Jan. 7—1874, Mar. 8 (pres. 1850, July 9—1853, Mar. 4); b. at Summer Hill, N. Y. Born of English parents, in rather straitened circumstances, all his education was in the village school. At the age of 15 he was sent to Livingston co., to learn the drapery trade, and soon afterward was bound apprentice to a wool-carder in his native village. During four years at this occupation, he used every means at his disposal to cultivate his mind. devoting his evenings to reading and study. In his 19th year he made the acquaintance of a lawyer named Wood, who discovering in the young man talents worthy of a loftier sphere, took an interest in him, and offered him a situation in his office, at the same time supplying him with funds for the prosecution of his studies for the legal profession. F. entered with ardor on the course marked out for him, and in order that he might not be too great a burden upon his friend, applied a part of his time to teaching school. He removed to Buffalo 1821 to complete his studies, and 1823 was admitted a member of the bar. He gradually acquired reputation, and in 1829, he began his political career, being in that year chosen a representative of Erie co. in the legislature of N. Y., where he entered the ranks of the whig party, at that time in opposition. Here his probity and modesty soon gained universal esteem. He was mainly instrumental in procuring in N. Y. the abolition of imprisonment for debt. In 1832, F. was elected a member of congress; and he was several times re-elected; but in 1844 he resumed his profession. In 1847, however, he returned to public life, being elected by a large majority to the post of comptroller of N. Y. and in the following year he was the whig candidate for vice-pres. of the United States, on the ticket with Gen. Zachary Taylor for pres. The whigs were successful, and F. entered on his office 1849, Mar. 5. By the unexpected death of General Taylor, 1850, July 9, F. became president. His presidency was creditable in its aims, and in many of its measures, notwithstanding that his party were in the minority in congress, and that the shadow of the coming war was even then beginning to darken the land and confuse legislation with bitter partisanship and continuous attempts at an impossible compromise. F. promoted as far as he could the progress of exploration and discovery, at home and abroad. In 1855, he visited Europe, and on his return 1856, he was again nominated for the presidency, but failed of election. F. took no active part in the civil war; though nominally he sided with the Union. After the close of his presidential term, he returned to Buffalo, where he died.

FILLY, n. *fĭl'lĭ* [prov. Dan. *fyllie;* Icel. *fylja*, a filly—from *foli*, a foal]: a young mare, as opposed to a colt or young horse: a wanton girl.

FILM, n. *fĭlm* [AS. *film*, a skin: Fris. *fimel*, the skin of the body: W. *pilen*, rind]: a thin skin: V. to cover with a thin skin. FIL'MING, imp. FILMED, pp. *fĭlmd.* FILMY, a. *fĭl'mĭ*, composed of thin skins or membranes. FIL'MINESS, n.

FILM, a substitute for glass plates in photography. It consists of a thin strip of colorless, transparent celluloid, coated on one side with the sensitized collodion substance used for dry-plates. This is wound on a roller and placed in the camera in such a manner that as it is unwound from one roller it is wound on another, allowing one part after another to be exposed. The film is usually protected by a backing of black paper marked at intervals with white figures, which are read through a red celluloid target in the back of the camera, showing the correct length to be unwound for an exposure. The film has a great advantage over the plate in lightness and small bulk, and by the introduction of film-developing machines the processes of developing and fixing are much simpler and more convenient than in the case of plates.

FILOSE, a.: see FILAMENT.

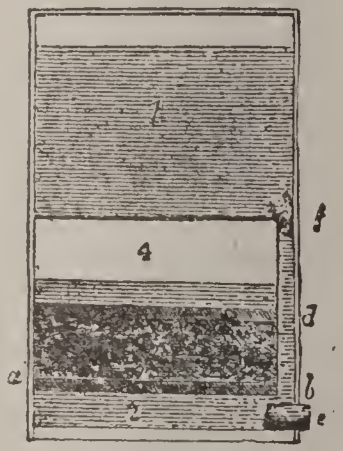
FILOSELLE, n. *fĭ'lō-zĕl'* [F.]: a kind of floss silk.

FILTER, n. *fĭl′tėr* [F. *filtrer*, to filter—from mid. L. *filtrum*, a bit of *felt*, or other stuff through which to strain liquids: It. *feltro*, a felt, a filter]: any open porous substance, as cloth, paper, sand, or gravel, through which a liquid may drain; a strainer: V. to purify; to pass through a filter. Fil′tering, imp.: N. act of passing through a filter. Fil′tered, pp. *-tėrd*, strained. Fil′trate, v. *-trāt*, to strain; to filter. Filtra′tion, n. *-trā′shŭn* [F.—L.]: the act or process of filtering.

FIL′TER—FILTRATION: the substance or apparatus through which liquid is strained:—the process of such straining. When solid matter is suspended in a liquid in which it is insoluble, it may be separated by various means. For various methods of causing such suspended matter to collect together and sink to the bottom or float on the surface, and thereby clearing the liquid, see Fining. The process of filtration consists in passing the liquid through some porous substance, the interstices of which are too small to admit of the passage of the solid particles, the principle of the action being the same as that of a sieve; but as the particles of fluids are immeasurably small, the pores must be extremely minute.

One of the simplest forms of filter is that commonly used in chemical laboratories for separating precipitates, etc. A square or circular piece of blotting-paper is folded in four, the corner where the four holds meet is placed downwards in a funnel, and one side is partly opened, so that the paper forms a lining to the funnel. The liquid passes through the pores of the paper, and the solid matter rests upon it. The chief advantages of this filter are its simplicity, and the ease with which the solid matter may be removed and examined. A simple water-filter for domestic purposes is sometimes made by stuffing a piece of sponge in the bottom of a funnel or the hole of a flower-pot, and then placing above this a layer of smooth pebbles, then a layer of coarse sand, and above this a layer of pounded charcoal three or four inches in depth. Another layer of pebbles should be placed above the charcoal, to prevent it from being stirred up when the water is poured in. It is obvious that such a filter will require occasional cleaning, as the suspended impurities are left behind on the charcoal, etc. This is best done by renewing the charcoal, etc., and taking out the sponge and washing it. By a small addition to this, a cottage-filter may be made, which, for practical use, is quite equal to the most expensive filters of corresponding size. It consists of two flower-pots, one above the other; the lower one is fitted with the sponge and filtering layers above described, and the upper one with a sponge only. The upper pot should be the largest, and if the lower one is strong, the upper one may stand in it, or a piece of wood with a hole to receive the upper pot may rest upon the rim of the lower one. The two pots thus arranged are placed upon a three-legged stool with a hole in it, through which the projecting part of the lower sponge passes, and the water drops into a jug placed below. The upper pot serves as a reservoir, and its sponge stops the coarser impurities, and thus the filtering layers of the lower one may be used for two or three years without being renewed, if the upper sponge be occasionally cleaned. Care must be taken to wedge the upper sponge tightly enough, to prevent the water passing from the upper pot more rapidly than it can filter through the lower one.

A great variety of filters are made on a similar principle to the above, but constructed of ornamental earthenware or porcelain vessels of suitable shape. In purchasing a filter, the buyer must not be satisfied with merely seeing that the water which has passed through it is rendered perfectly transparent—this is easily done by a new and clean filter—but he should see that the filter is so constructed as to admit of being readily cleansed, for the residual matter must lodge somewhere, and must be somehow removed. When large quantities of water have to be filtered, this becomes a serious difficulty, and many ingenious modes of overcoming it have been devised. In most of these, water is made to *ascend* through the filtering medium, in order that the impurities collected on it may fall back into the impure water. Leloge's ascending filter consists of four compartments, one above the other; the upper part, containing the impure water, is equal in capacity to the other three. This communicates by a tube with the lower one, which is of small height, and whose top is formed by a piece of porous filtering-stone, through which alone the water can pass into the third compartment, which is filled with charcoal, and covered with another plate of porous stone. The fourth compartment, immediately above the third, receives the filtered water, which has been forced through the lower stone, the charcoal, and the upper stone. A tap is affixed to this, to draw off the filtered water, and a plug to the second or lower compartment, to remove the sediment. In the diagram showing this filter in section, the figures 1, 2, 3, and 4 indicate the corresponding compartments. At *f*, the top of the tube by which the first and second compartments communicate, a sponge may be placed to stop some of the grosser impurities. Since 1831, when this filter was contrived, a number of ascending filters have been patented, many of them being merely slight modifications of this. Bird's Siphon Filter is a cylindrical pewter vessel containing the filtering media, and to it is attached a long coil of flexible pewter pipe. When used, the cylinder is immersed in the water-butt or cistern, and the pipe uncoiled and bent over the edge of the cis-



Leloge's Filter:
1, 2, 3, 4, the four compartments; *ab*, the first porous stone of third or filtering compartment; *cd*, the exit filtering stone of *d*; *e*, the plug to remove for cleaning out second compartment; *f*, a loose sponge at entrance of communicating tube.

tern, and brought down considerably below the level of the water. It is then started by applying the mouth to the lower end, and sucking it till the water begins to flow, after which it continues to do so, and keeps up a large supply of clear water. This, of course, is an ascending filter, and the upward pressure is proportionate to the difference between the height of the water in the cistern and that of the lower end of the exit tube: see SIPHON. Sterling's filtering tanks are slate cisterns divided into compartments, the water entering the first, then passing through a coarse filter to a second, and thence through a finer filter to the main receptacle, where the filtered water is stored and drawn off for use.

A common water-butt or cistern may be made to filter the water it receives by the following means: Divide the cistern or butt into two compartments, an upper and a lower, by means of a water-tight partition or false bottom: then take a wooden box or small barrel, and perforate it closely with holes; fit a tube into it, reaching to about the middle of the inside, and projecting outside a little distance; fill the box or barrel with powdered charcoal, tightly rammed and cover it with a bag of felt; then fit the projecting part of the tube into the middle of the false bottom. It is evident that water can pass from the upper to the lower compartment only by passing through the felt, the charcoal, and the tube, and thus, if the upper part receives the supply, and the water for use is drawn from the lower part, the whole will be filtered. It is easily cleaned by removing the felt and washing it.

Various means of compressing carbon into solid porous masses have been patented, and filters are made in which the water passes through blocks of this compressed carbon. Most of these are well adapted for the purpose, but their asserted superiority over filters composed of layers of sand and charcoal is doubtful. An elegant and convenient portable filter for soldiers, travellers, and others who may require to drink from turbid ponds and rivers, was constructed of Ransome's filtering stone, and is made also of the compressed carbon. A small cylinder of the stone or carbon is connected with a flexible India-rubber tube in such a manner that the cylinder may be immersed in a river, the mouth applied to a mouth-piece at the other end of the tube, and the water drawn through the filtering cylinder.

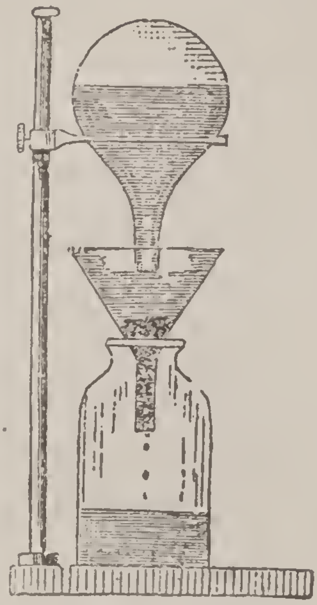
For the filtration of water on a large scale, see WATER-SUPPLY.

Some very interesting experiments were made by Mr. H. M. Witt, to ascertain whether soluble matter, such as common salt, is in any degree removed from water by filtration. Theoretically, it has been assumed that this is impossible, since the filter acts only mechanically in stopping suspended particles; but the results of Mr. Witt's experiments show that 5 to 15 per cent. of the soluble salts were separated by sand filters such as above described. This is a curious and interesting subject, worthy of further investigation. Another most important matter, on which a series of accurate experiments is required, is to ascertain to what extent soluble organic matter may be decomposed by filtration, especially by charcoal filters, and to ascertain how long charcoal and other porous matter retains its property of acting on organic matter in watery solution. The power of dry charcoal in decomposing organic matter in a gaseous state is well established (see below), and it is also well known that fresh charcoal acts powerfully upon organic matter in solutions, but the extent to which this power is retained in the charcoal of a filter in continuous action has not been ascertained. This is of the highest importance, as it sometimes happens that water of brilliant transparency, and most pleasant to drink, on account of the carbonic acid that it contains, is charged with such an amount of poisonous organic matter as to render its use as a daily beverage very dangerous Charcoal obtained from burning bones is more efficacious than charcoal from wood. A filter of animal charcoal will render London porter colorless. Loam and clay have similar properties. Prof. Way found that putrid urine and sewer-water, when passed through clay, dropped from the filter colorless and inoffensive.

When a liquid contains mucilaginous or other matter having viscous properties, there is considerable difficulty in filtering it, as the pores of the medium become filled and made water-tight. Special filters are therefore required for syrups, oils, etc. Such liquids as ale, beer, etc., would be exceedingly difficult to filter; therefore they are clarified by the processes described under FINING. Oil is usually passed through long bags made of twilled cotton cloth (Canton flannel). These are commonly 4 to 8 ft. long, and 12 to 15 inches in diameter, and are inclosed in coarse canvas bags, 8 to 10 inches in diameter, and thus the inner filtering-bag is corrugated or creased, and a large surface in proportion to its size is presented. Syrups are filtered on a small scale by confectioners, etc., by passing them through conical flannel bags, and on a large scale in the *creased bag-filter* above described. Thick syrups have to be diluted or clarified with white of egg, to collect the sediment into masses, and then they may be filtered through a coarse cloth strainer. Vegetable juices generally require to be treated in this manner.

The simple laboratory filter has to be modified when strong acid or alkaline solutions, or substances which are decomposed by organic matter, require filtration. Pure silicious sand, a plug of asbestos, pounded glass, or clean charcoal, are used for this purpose. Böttger recommends gun-cotton as a filter for such purposes. He has used it for concentrated nitric acid, fuming sulphuric acid, chromic acid, permanganate of potash and concentrated solutions of potash and aqua regia. He says that properly prepared gun-cotton is attacked at ordinary temperature by only acetic ether.

Filtering paper for laboratory purposes requires to be freed from inorganic impurities that are soluble in acids, etc.; this is effected by washing the paper with hydrochloric acid, or, when thick, with nitric and hydrochloric acid, and removing the acid by washing thoroughly with distilled water.



When a considerable quantity of liquid has to pass through a filter, it is sometimes desirable that it should be made to feed itself. In the laboratory this is done by inverting a flask filled with the liquid over the filtering funnel, the mouth of the flask just touching the surface of the liquid when at the desired height in the funnel. As soon as it sinks below this, air enters the flask, and some liquid falls into the funnel. On a large scale, self-acting filters are fed by the common contrivance of a ball-cock and supply-pipe.

Air Filters.—The extraordinary powers of charcoal in disinfecting the gaseous products evolved from decomposing animal and vegetable matter, have been made available by Dr. Stenhouse in an apparatus for purifying air that is made to pass through it. A suitable cage, containing charcoal in small fragments, is fitted to the opening from which the deleterious gases issue, and is found to render them perfectly inodorous, and probably innocuous. The first application of this was made 1854, when a charcoal air-filter was fitted up in the justice-room of the Mansion House, London, the window of which opens above a large urinal, the smell of which was very offensive in the room. The filter at once destroyed the nuisance, and the charcoal has been found to last many years without the need of renewal. 103 such filters have been applied to the outlets of the sewers of one district of the city of London, and no bad smell is observable where they are placed, and no obstruction offered to the ventilation of the sewers. They have been applied with like results in two or three county towns. The subject is fully treated by Dr. Stenhouse in a letter to the lord mayor, published by Churchill (London). Charcoal respirators are small air-filters of the same kind applied to the mouth: see RESPIRATOR.

FILTH, n. *fĭlth* [AS. *filth*, filth: Icel. *fyla*, to stink, to putrefy (see FOUL)]: dirt; defilement; foul matter; anything which pollutes the mind. FILTHY, a. *fĭl'thĭ*, foul; dirty; unclean; morally impure. FIL'THILY, ad. *-lĭ*, foully; grossly. FIL'THINESS, n. nastiness; corruption; impurity.—SYN. of 'filthy': foul; impure; polluted; nasty; muddy; miry; sloughy; squalid; gross; sluttish; vulgar; licentious.

FILUM AQUÆ, *fī'lŭm ā'kwē* [Lat., thread of water]: legal expression, meaning the boundary line determined by a stream of water flowing between the land of two separate owners. Where an unnavigable stream or where a navigable stream above the point where the tide ebbs and flows is cited as the boundary between the separate portions of land lying opposite to each other on its shores, each owner is held to possess the land to the centre or axis of the stream. This imaginary line is called in legal parlance *filum aquæ*. This ownership applies only to the land beneath the water; no right of disturbing the stream beyond the extent involved in ordinary use of the water is implied. If an island forms in the middle of the stream each riparian owner has a right to one-half thereof. In some of the states the courts hold that the *filum aquæ* only exists in unnavigable streams, and that the state owns the beds of all navigable rivers, even though they are unaffected by the tide.

FIMBRIATE, a. *fĭm'brĭ-āt*, or FIM'BRIATED, a. [L. *fimbrĭæ*, threads, fringe]: fringed at the margin; bordered; in *her.*, said of an ordinary having a narrow border or edging of another tincture. FIM'BRIÆ, n. plu. *-brĭ-ē*, in *anat.*, a structure resembling a fringe. FIMBRILLIF'EROUS, a. *-brĭl-lĭf'ėr-ŭs*, in *bot.*, bearing numerous little fringes, as the receptacle of some composites.

FIN, n. *fĭn* [AS. *finna;* Dan. *finne;* L. *pinna*, a fin—see letter F]: the membrane or limb of a fish for support and locomotion (see FINS). FINNER, or FINBACK, any whale which has an adipose fin on its back. The genera *Megaptera*, *Balænoptera*, and *Physalus* have this character. They all belong to the family *Balænidæ*. FINNED, a. *fĭnd*, having fins. FINNY, a. *fĭn'nĭ*, furnished with fins. FIN'-LESS, a. without fins. FIN-FISH, sailor's name for some of the fin-backed whales, especially for the Northern Rorqual, or Razor-backed Whale. FIN-FOOT, in *zool.*, *Heliornis*, genus of S. American and Burmese birds belonging to the family *Rallidæ* or rails. FIN-PIKE, the *Polypteri*, subfamily of ganoid fishes. FIN-SCALE, a name given to the rudd or red-eye. FIN-RAY, the rigid part of the fin in fishes. FIN-FOOTED, web-footed; having membranes between the toes.

FINABLE: see under FINE 1.

FINAL, a. *fī'năl* [F. *final*—from L. *finālis*—from *fīnĭs*, an end]: last; conclusive; pertaining to the end. FI'NALLY, ad. *-lĭ*. FINALITY, n. *fī-năl'ĭ-tĭ*, the state of being final; completeness. FINALE, n. *fĭ-nâ'lā* [It.]: close; termination; that part of a musical composition which finishes the act of an opera; also the last movement of an instrumental composition, as in the symphony, quartet, quintet, sonata, etc. The character of the finale, in purely instrumental works, is always lively: in the opera, it depends on the subject, in some operas the finale consists of an aria alone, as in Mozart's *Figaro*, instead of the usual full concerted music for soli and chorus. FINAL CAUSE: see TELEOLOGY.—SYN. of 'final': ultimate; latest; decisive; terminating.

FINALE, *fē-nâ'lā:* town of n. Italy, province of Modena, on the Panaro, 22 m. n. e. from Modena. It is surrounded by walls, has manufactures of linen and silk, and an active general trade. Pop. 4,500.

FI'NAL JUDG'MENT. The meaning of this term in the law of Scotland having led to some dispute, an Act of Sederunt (q.v.) was passed on the 11th July, 1828, declaring it to be applicable to a case in which 'the whole merits of the cause have been disposed of, although no decision has been given as to expenses, or, if expenses have been found due, although they have not been modified or decerned for.' The importance of the definition arises from the fact that only final judgments can be carried by advocation from the inferior to the superior courts. 'The whole merits of the cause' has been held to mean, not only the merits of the action to which the advocator is a party, but also those of any other conjoined with it. If the parties in the conjoined action will not proceed to have it determined, the advocator ought to apply to the inferior judge, stating his intention to advocate, and praying him to call on the parties to proceed with the conjoined process; and, failing their doing so, to disjoin the causes, which disjunction will render an advocation competent. Shand's *Practice,* i. p. 454. In Advocations (q.v.) and Suspensions (q.v.), if the record be closed, and the proof concluded in the inferior court, the case may be taken at once to the Inner House without a judgment of the Lord Ordinary, 13 and 14 Vict. c. 36. In order to warrant an appeal to the circuit court in a civil cause (where otherwise competent) not only the merits must have been disposed of, but the expenses modified and decerned for.

FINANCE, n. *fĭ-năns'* [OF. *finance,* wealth, an exaction, a compulsory payment—from mid. L. *financĭă,* a payment—from *fīnārĕ,* to pay a fine or tax—from mid. L. *finis,* the termination of a suit in law, the money paid as the price of settlement—from L. *finis,* the end: OF. *finer,* to pay an exaction or composition]: revenue; income: V. among *commercial men,* to raise money or funds, generally for a special or speculative object. FINAN'CING, imp. FINANCED, pp. *fĭ-nănst'.* FINANCES, n. plu. *fĭ-năn sĕz,* income or resources; funds in the public treasury. FINANCIAL, a. *fĭ-năn'shăl,* pertaining to public revenue or income. FINAN'CIALLY, ad. *-lĭ.* FINANCIER, n. *fĭ-năn'sēr,* one skilled in the principles of banking, or in the management and raising of the public revenue.

FINA'NCE: science or art of managing money matters. F in the plural, finances, is often used for money itself, but still with a reference to the purpose to which it is to be applied, as where the finances of a country are said to have improved or fallen off—that is to say, have become abundant or scanty according to the expenditure of the country. Sometimes the word is applied to private wealth, but it is properly applicable to public funds. In Britain and the United States, it is used rather in a political and economic sense than officially, but in France there have been, from time to time, comptrollers-gen. of finance, councils of finance, bureaus of finance, etc. Many statesmen have been spoken of as great financiers, from the talent which they have shown for adjusting national revenue and expenditure, as Colbert, Turgot, and Necker in France, Godolphin and Peel in Britain, and Hamilton, Fessenden, and Sherman in the United States. As a branch of statesmanship, F. is intimately connected with other branches. In questions of national policy—such as, whether a state can go to war or not—the financier is the person who is expected to count the cost, and say how the necessary funds are to be obtained. In the question, whether an unpopular or oppressive tax is to be abolished, or a desirable tax to be imposed, the financier is an authority on the question, whether the government can do without it, or how, if needful, it shall be imposed. Hence, there is a special connection between F. and taxation, which has become closer and stronger since the progress of political economy has shown that the taxes which are the most productive, and even the most easily collected, are not always the best, looking at the gain or loss of a nation, in the long-run. Turgot said that F. was the art of plucking the fowl without making it cry. On this principle indirect taxation, e.g., as involved in customs duties, has achieved its popularity, since such duties often bring no tangible hardships on any one. Yet, indirect taxes, because of their very indirectness, need careful watching and skillful adjustment to the needs of each case. See further, CUSTOMS: DEBT, NATIONAL: CORN LAWS: EXCISE: FREE TRADE: TAXATION: TARIFF: REVENUE: also, BANK. CURRENCY: MONEY.

FINBACK: see RORQUAL.

FINCH, n. *fĭnsh* [AS. *finc;* Dut. *vink;* Ger. *fink;* W. *pinc*, a chaffinch (see CHAFFINCH)]: popular name of a great number of species of little birds of the order *Insessores*, tribe *Conirostres*. Many have great powers of song, and are called *Hard-billed Song-birds*, in contradistinction to the Warblers (*Sylviadæ*) or *Soft-billed Song-birds*. The name F. is sometimes used as equivalent to *Fringillidæ* (q.v.), either in its more extensive or more restricted application; but the limits of its popular use are very indeterminate, and some birds are equally known as finches and linnets, or as grosbeaks, etc. The word F. often forms part of the popular name of birds of this family, as bullfinch, chaffinch, hawfinch, pine-finch, etc.

FIND, v. *fīnd* [Icel. *finna;* Ger. *finden*, to find]: to discover; to recover; to regain something lost; to gain or have; to furnish or supply; to arrive at; to perceive; to determine, as by a verdict: N. discovery; thing found. FIND'ING, imp.: N. that which is found by the jury; a verdict. FOUND, pt. and pp. *fownd*, did find. FIND'ER, n. one who. FINDING-SHOP, shop where shoemaker's tools are sold. TO FIND IN ONE'S HEART, to be bold enough or hard-hearted enough to do a thing. TO FIND OUT, to discover; to detect. TO FIND FAULT, to censure.

FIND'ER OF GOODS: one who discovers articles lost by another. The F. acquires a special property in goods which is available to him against all the world except the true owner; but before appropriating them to his own use, he must use every reasonable means to discover the owner. It has been decided that if the property had not been designedly abandoned, and the finder knew who the owner was, or knew that he could have discovered him, he was guilty of larceny in keeping and appropriating the articles to his own use. In a case in England, in which a person purchased, at public auction, a bureau, in which he afterward discovered, in a secret drawer, a purse containing money, which he appropriated to his own use, Mr. Baron Parke thus laid down the law: 'The old rule, that "if one lose his goods, and another find them, though he convert them *animo furandi* to his own use, it is no larceny," has undergone in more recent times some limitations. One is, that if the finder knows who the owner of the lost chattel is, or if, from any mark upon it, or the circumstances under which it was found, the owner could be reasonably ascertained, then the fraudulent conversion, *animo furandi*, constitutes a larceny.' This law, however, though in most cases clear, is, in some, extremely difficult in application, and judges and juries often go wrong. The question for the jury is not whether they think that the F. could have discovered the owner, but whether he believed that he could; and, if not satisfied as to this, they cannot convict him of larceny. It is a mistake to suppose that the F. is bound in law—though he may well be in honor—to advertise, or use extraordinary means to discover the owner; indeed he cannot claim such expenses from the real owner, if he appear.

FINDHORN, *find'horn:* river rising on the w. side of the Monadh Liadh Mountains, in the e. of Inverness-shire, Scotland. It runs n.e. through the counties of Inverness, Nairn, and Elgin, in the valley of Strathdearn, passes Forres, and enters the Moray Firth at the village of Findhorn by a lagoon three m. by one and a half m. in extent, after a course of about 90 m. Its waters abound in salmon and trout. Its basin consists of gneiss in the upper part, and of old red sandstone in the lower. At one place it rose nearly 50 ft. in the great floods of 1829, Aug., known as the 'Moray Floods,' and did much damage. W. of the mouth of the F. are the Culbin Sands, in one part 118 ft. high, and covering 9,500 acres of a formerly fertile tract.

FINDLAY, *find'lā:* city, cap. Hancock co., O.; on Blanchard's Fork of the Auglaize river; on the Lake Erie and Louisville, and the F. Branch railroads; 31 m. e.n.e. of Lima, 37 m. s.w. of Fremont. F. is the centre of the natural gas region, contains 18 churches, 3 national banks (cap. $350,000), and one private bank, 3 weekly newspapers, and has extensive glass-works, rolling-mills, nail-factories, machine shops, foundries, flour, oil, and flax mills, and woolen, carriage, spoke, and stave factories. The discovery of natural gas and the opening of gas-wells have given an immense impetus to manufacturing and a sudden growth in population. Pop. (1870) 3,315; (1880) 4,633; (1890) 18,553; (1900) 17,613.

FINE, n. *fīn* [mid. law L. *finis*, applied to the money paid as the price of settlement (see FINANCE)]. a sum of money paid as a penalty, as a punishment, or as the price of exemption; a sum of money paid for obtaining a benefit or privilege, as for obtaining or renewing a lease: V. to impose a penalty on; in *OE.*, to pay a fine. Fi′ning, imp. Fined, pp. *fīnd*, subjected to the payment of a sum of money as a penalty or for a privilege. Finable, a. *fī′nà-bl*, subject to a fine or penalty.—Syn. of 'fine, n.': mulct; penalty, forfeit, amercement.

FINE, n. *fīn* [Ger. *fein;* It. *fino;* F. *fin*, slender, clear—from mid. L *finītus*, finished, perfected—hence, refined, keen: W. *gwyn*, white, fair: Icel. *fina*, to polish, to cleanse: comp. Gael. *fionn*, white, pure]: not coarse; very thin; of small diameter: slender; clear; elegant; beautiful; very handsome; in *OE.*, artful; fraudulent; sly; over-sly cunning, or nice, as 'my fine fellow': V. to clarify; to free from foreign matter; in *OE.*, to decorate; to embellish. Fi′ning, imp. refining, purifying: N. the process of refining or purifying (see below). Fined, pp. *fīnd.* Fine′ly, ad. *-lĭ*, in a fine manner; beautifully; not coarsely. Fine′ness, n. thinness; clearness; delicacy; purity. Fi′ner, n. one who purifies metals. Fi′nery, n. *-nér-ĭ*, show; splendor; showy dress or ornaments; a furnace at ironworks for purifying iron. Fine-drawing, art of sewing up rents with such skill that they are imperceptible; a finishing process with cloth, in which it is subjected to a strong light, while all faulty parts or breaks in the fabric are closed by sound yarn introduced by a needle. Fining-forge, in *metal.*, open hearth with a blast, by which iron is freed from impurities or foreign matters. Cast-iron is thus rendered malleable. Fining-pot, a pot or crucible for refining metals. Fining-roller, in *paper-making*, a cylindrical wire-cloth sieve in the paper-making machine, which allows the finely-ground stuff to pass, but restrains the coarse fibres and knots. Fine spoken, using a number of fine phrases. Fine spun, minute; ingeniously contrived; artfully invented. Fine arts: see under Art.—Fine-drawn, over minute or nice. *Note.*—Two lines of derivation of Fine are given, showing the usual amount of confusion and adaptations.—Syn. of 'fine, a.': finished; refined; excellent; superior; showy; subtile; thin; subtle; nice; delicate; exquisite; artful; sly; comminuted; filmy; attenuate; keen; light; delicate; minute; pure.

FINE, *fīn* [L. *fīnis*, an end]: used only in the adverbial phrase in fine, to conclude; to sum up all: V. in *OE.*, to end. Fine′less, a. *fīn′lĕs*, in *OE.*, boundless; endless.

FINE OF LANDS, in England: fictitious proceedings formerly in common use to transfer or secure real property by a mode more efficacious than an ordinary conveyance. A F. (so named because it put a termination (*finis*) to all litigation between the parties and those claiming through them in regard to all matters touching the suit) was at first an amicable composition between parties; afterward this procedure was generally adopted for conveyance of land. It was abolished by the *Fines and Recoveries Act*, 3 and 4 Will. IV. c. 74. See Conveyances; Uses; Feme Coverte.

FINERY: see Fine 2.

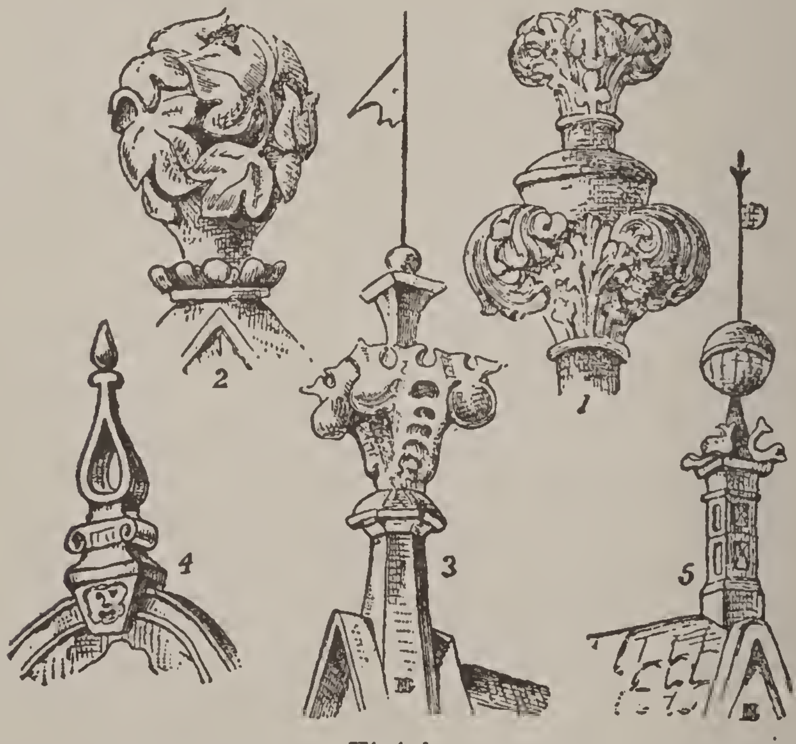
FINESSE, n. *fĭ-nĕs'* [F.—from *fin*. fine, slender—from *fīnītus*, finished, perfect]: artifice; stratagem. **Fines'sing**, a. practicing artifice to accomplish a purpose: N. the practice of artifice.

FINGAL, *fĭng'gal*: hero in a collection of poems purporting to have been written by Ossian, son of F., and translated from the ancient Gaelic language by James Macpherson (1762); also title of a separate poem in six books. Macpherson's first work was *Fragments of Ancient Poetry collected in the Highlands of Scotland, and Translated from the Gaelic or Erse Language* (1760). This had such success among scholars that he was urged to continue his literary researches, and published *Fingal, an Ancient Poem in Six Books, together with Several other Poems composed by Ossian, Son of Fingal*, etc. (1762), and *Temora, an Ancient Epic Poem, in Eight Books* (1763). For some time the various poems produced a literary sensation; at length critics began calling on Macpherson for the original Gaelic of Ossian. He declined the requests, and a controversy was opened that lasted 50 years, during which Dr. Johnson gave his opinion that the poems had never existed in any other form 'than that which we have seen.' Subsequently the Highland Soc. of London declared that 'no poems of the kind can be found to exist in the memories of the Highlanders.' The reproduction of the Highland spirit and style is remarkable, giving a certain interest and value to this strange work.

FIN'GAL'S CAVE: see Staffa.

FINGER, n. *fĭng'gėr* [Goth. *figgrs;* Dut. *vinger;* Icel. *fingr;* Ger. *finger;* Fris. *fenger*, a finger: Ger. *fangen*, to seize, to catch]: one of the five divisions of the hand; a measure (see Hand). **Fingerer**, one who fingers; a pilferer; a purloiner; a thief: V. to touch lightly; to handle with the fingers. **Fin'gering**, imp. handling; touching lightly: N. act of touching lightly or handling; manner of touching a musical instrument. **Fin'gered**, pp. *-gėrd*, played on; handled; touched: Adj. having fingers. **Finger-post**, a post with a painted hand for directing passengers to a road. **Finger-board**, that part of a stringed musical instrument, as in the violin, violoncello, gúitar, etc., which is made of ebony-wood, and glued on the neck of the instrument, and shaped on the top somewhat round, to suit the position in which the strings lie on the nut and the bridge. At the lower end, the finger-board projects over the sounding-board of all those instruments played with the bow, while in the guitar species the finger-board is glued down on both neck and sounding-board. The strings are stretched along the finger-board from the nut at the top to the bridge at the lower end, and are pressed down by the fingers of the left hand, to make the different notes in music; while the right hand produces the sound either by a bow or the points of the fingers. In a piano or organ, the finger-board is the bank or row of keys which are pressed down by the fingers. **Finger-fern**, *Asplenium ceterach.* **Finger-flower**, *digitalis purpurea.* **Finger-glass**, glass or bowl in which to rinse the fingers after dinner or dessert. Finger-grass, *Digitaria*, genus of grasses. Finger-grip, tool for recovering rods or tools dropped into a bored shaft. To have at one's finger-ends, to be thoroughly familiar or off-hand with. Finger-and-toe, a diseased form of turnip-growth, in which the bulbs are divided into two or more forks: see Anbury.

FINIAL, n. *fĭn'ĭ-ăl* [L. *fīnĭs*, an end—from *finīrĕ*, to finish or complete]: ornament, generally carved to resemble foliage, which forms the termination of pinnacles, gables, spires, and other portions of Gothic architecture. There are traces of foliated terminations, both in stone and metal, on the pediments of classic buildings (see Acroterion), but it was not till the 12th c. that the F. proper was introduced. During the latter part of that c. and the whole of the 13th c. finials of perfect form and of endless variety were used as the crowning ornaments of every salient point in the buildings of the period (see fig. 1). The architects of the 14th c., in finials, as in other ornaments, imitated more closely the forms of natural foliage; but their finials had neither the variety of design nor the vigor of outline of those of the preceding century (see fig. 2). In the 15th and 16th c., the finials became more and more meagre in form, and are frequently only four crockets set upon a bare pyramidal terminal. Some variety of effect is often obtained during this period by surmounting the finial with a gilded vane. This is common in Tudor and domestic architecture (fig. 3). Finials were carved both in stone and in wood, and in the latter material with great delicacy and minuteness. In connection with metal-work, finials of



Finials:
1, from Bishop Bridport's Monument, Salisbury Cathedral; 2, York Minster; 3, Maulbroun, Germany; 4, Crew Hall, Cheshire; 5, Augsburg.

metal were used, and whatever the material adopted, its natural capabilities were made a source of special beauty.—The finial is one of the most effective ornaments of Gothic architecture, and when that style was succeeded by the revival of classic, in the reign of Queen Elizabeth, our forefathers could not persuade themselves to part with the finials to their buildings. We thus find in Elizabethan architecture a great variety of finials; they are, however, almost entirely of geometric form, and without foliage (fig. 4), and are frequently, especially when terminating wooden gables, combinations of finial and vane partly wood and partly iron (fig. 5). In the stricter classic which succeeded the Elizabethan, some traces of the favorite F. remain in the balls, obelisks, etc., used as terminations, and also in the shields and supporters (themselves a remnant of feudalism) which form the crowning ornament of gate-piers, pedestals, etc.

FINICAL, a. *fĭn'ĭ-kăl* [Dut. *fijnkens*, perfectly, neatly: comp. Gael. *fionag*, an animalcule, a mite (see Fine 2)]: affectedly nice or showy; affectedly precise in trifles; effeminate; foppish. Fin'ically, ad. *-lĭ*. Fin'icalness, n. Finic, a. *fĭn'ĭk*, or Finicking, a. *fĭn'ĭ-kĭng*, and Finikin, a. *fĭn'ĭ-kĭn*, affectedly nice; unduly particular; fastidious; fussy; finical.

FIN'ING: process of clearing turbid liquors, such as beer, wine, etc. The simplest mode of F. is by passing the liquor through a porous substance that retains the solids and allows the clear liquid to pass (see Filter); but this method is applicable only to particles mechanically suspended in a limpid liquid. When the liquid contains mucilaginous or other matter that readily clogs the filter, some other means of F. must be used; as with all malt liquors and most wines when turbid. When in good condition, these do not usually require F. as the suspended matter agglomerates, and sinks to the bottom shortly after the fermentation is completed. When this does not take place, some means of promoting such action are usually adopted. One of the simplest is to add soluble albumen, such as white of egg, to a portion of the liquid, and after beating it well in this, to add the mixture, and stir it into the whole of the liquid. Upon application of heat, the albumen coagulates and contracts from its diffusion into a scum, enveloping and drawing together the suspended matter. The scum is then easily removed. This method is adopted for syrups and other liquids that may be heated without mishief. In making clear soups, the albumen of the meat performs this function. As alcohol coagulates albumen, it may be used for fining wines and cordials without the application of heat. It is generally used for red wines. Malt liquors are usually fined by means of gelatine, either isinglass or cheaper substitutes being used. One pound of isinglass is soaked in three or four pints of water or sour beer, then more sour liquor added as the isinglass swells, until it amounts to about a gallon. The jelly thus formed is next dissolved in seven or eight gallons of the liquor to be fined. This solution, having the consistence of a syrup, is called 'brewers' finings,' and about a pint to a pint and a half is added to a barrel of ale or porter, or to a hogshead of cider or wine. The action of this depends upon the combination of the gelatine with the astringent matter (tannic acid) of the liquor, forming thereby an insoluble solid, which sinks to the bottom, and carries with it, like the coagulating albumen, the suspended matter; but as the flavor of malt liquors depends partly on the astringents that they contain, the F. affects the flavor; the astringents also help to preserve the liquor; hence their removal is in this respect disadvantageous. Malt liquors thus fined do not 'stand well on draught.' The use of gelatine for fining red wines is objectionable, as in most of these the astringent flavor is an esteemed qualtity; therefore albumen is preferred.

Other methods of F. are adopted. Sugar of lead is sometimes added, and afterward one-half its weight of sulphate of potash dissolved in water. By this means, an insoluble sulphate of lead is precipitated, which in subsiding carries down other matters with it. This is a dangerous process, the salts of lead being poisonous. If properly conducted, the whole of the lead may be precipitated, but a casual mistake in the quantities might cause the death of many people. The method should never be resorted to. Ox-blood is used in the same manner as albumen and isinglass. Lime, alum, alcohol, and acids act by coagulating albumen etc,, contained in the liquor. Plaster of Paris, clay, and even sand, are sometimes used to carry down the suspended matters. A strip of isinglass or a piece of dried sole-skin is often used for fining coffee, and it acts in the manner above described. Liquors unusually difficult to fine are called 'stubborn' by coopers and cellarmen.

FINIS, n. *fī'nĭs* [L.]: end; conclusion.

FINISH, v. *fĭn'ĭsh* [F. *finissant*, finishing—from *finir*, to finish—from L. *finīrĕ*, to put an end to—from *fīnĭs*, an end: It. *finire*]: to put an end to; to complete; to perfect; to come to an end: N. completion; the last touch to a work; that which gives perfection to a work of art; the last coat of plaster on a wall. FIN'ISHING, imp.: ADJ. completing; perfecting: N. completion; perfection; last polish. FIN'ISHED, pp. *-ĭsht:* ADJ. complete; perfect in the highest degree. FIN'ISHER, n. one who puts an end to or completes.—SYN. of 'finish, v.': to close; conclude; terminate; end; accomplish; polish.

FINISTERRE, *fĭn-ĭs-tār'*, or FINISTERE [Lat. *Finis terræ*, 'Land's End']: dept. at the w. extremity of France, comprehending a part of the former duchy of Bretagne (q.v.); 2,648 sq. m. It is traversed from e. to w. by two low but picturesque chains of hills. Its coast is very rugged and broken, its shores bristling with dangerous granite rocks, and fringed with many islands. The soil, one-third of which is occupied by sandy tracts and marshes, is moderately productive; and owing to the vicinity of the sea, which washes the n., w., and s. shores of the department, the climate is mild and humid. Corn, hemp, and flax are grown in considerable quantities. In the valleys are smiling meadows. The silver and lead mines of F. are very valuable; those of Pouillaouen and Huelgoet being about the richest in France. Its principal rivers are the Aulne, the Elorn, and the Odet. The Aulne is connected by a canal with the Blavet, and forms part of the great line of communication by water from Brest to Nantes. This dept. is divided into five arrondissements: Quimper, Brest, Châteaulin, Morlaix, and Quimperlé. Quimper is the chief town. Pop. of F. (1886) 707,820; (1901) 773,014.

FIN'ISTERRE, CAPE, or LAND'S END: promontory at the n.w. extremity of Spain, lat. 42° 54′ n., and long. about 9° 20′ w.; the *Promontorium Nerium* of the ancients.

FINITE, a. *fī'nīt* [L. *finītus*, limited, bounded]: bounded; having limits. FI'NITELESS, a. unlimited. FI'NITELY, ad. *-lĭ*. FI'NITENESS, n. state of being limited; confinement within certain boundaries. *Note.*—INDEFINITE, without bounds. INFINITE, above relations to space.

FINLAND, *fĭn'land* [Fin. *Suomesimaa*, land of lakes and marshes]: a grand duchy of Russia, between 59° and 70° n. lat., and 21° and 33° e. long.; about 750 m. from n. to s., average breadth about 185 m. It is one of the general governments or provinces of Russia, and under the supreme authority of a gov.-gen., representing the emperor; area, 144,255 sq. m., of which nearly one-third is occupied by marshes and lakes. The largest of these sheets of water, independently of Lake Ladoga, which belongs partly to the Russian province of Olonetz, are Lakes Puruvesi, Payane, Enara, and Saima; the last of these, about 180 m. in length, constitutes a portion of the system of water-communication which has been established between the central parts of the country and the Gulf of Finland. The lakes are especially numerous in the s.w. of F. where they are almost all united together by rivers and waterfalls, round the central lake of Pyhäjärvi. The surface is a table-land, 400 to 600 ft. above the sea, with occasional higher elevations. There are no mountain ranges; hence the rivers are unimportant; but in the n. the country is intersected by a sandy ridge known as the 'Maanselkae,' which merges, under the name of the Lapintunturit Mountains, into the great Lappo-Norwegian Alpine chain. The coast-line is generally low, but to the s. is skirted by numerous rocky islands, separated from the land by narrow channels, difficult of navigation, but adapted for defense against hostile attacks from the sea. The principal geological formations are friable granite, hard limestone, and slate. The forests of F. are still very abundant, though they have been recklessly cut down in many parts of the country for the sake of their ashes, which are used to stimulate the soil, whose natural poverty requires to be counteracted by frequent manuring. Pine and fir predominate, but birch, beech, oak, etc., thrive in the s. of the country, where is also some good pasture-land. Since the incorporation of F. with Russia, agriculture has declined, and fishing and cattle-breeding increased in importance. The annual exports from F. have a value of about $25,000,000; the imports nearly reach $35,000,000. The most valuable are the products of the forests, as timber, pitch, potash, tar, and rosin; for the supply of grain is scarcely larger than the home demand, though at one time F. was regarded as the granary of Sweden for barley and rye. Few fruits ripen except hardy berries; and in the extreme north, vegetation is almost limited to mosses and liverworts. F. yields some copper, iron, lime, and slate, but produces scarcely any salt, which constitutes one of the principal articles of import. Reindeer, wolves, elks, beavers, and various kinds of game abound; while the numerous lakes, and the adjacent gulfs, supply the inhabitants with abundance of salmon, herring, and other fish. The climate is rigorous, and winter, which lasts seven or eight months, is succeeded by a brief spring, which passes almost suddenly into a short but hot summer of six or seven weeks, succeeded in its turn by a rainy season, which ushers in the return of cold weather. In the north, the sun is absent during a part of Dec. and Jan., and almost perpetually above the horizon during the short summer. F. is divided into eight lænes or governments—Nyland, Abo-Biorneborg, Tawastehuus, Wiborg, Kuopio, St. Michel, Wasa, Uleaborg, which are included in the three dioceses of Abo, Borgo, and Kuopio, and contain in all 214 parishes. The predominant form of religion is the Lutheran, but the Greek Church has of late years been gaining ground. The courts of law are held at Abo (anc. capital), Wasa and Wiborg; and there is one university, founded 1640 at Abo, but removed to the present capital, Helsingfors, 1829. The highest administrative authority is vested in the imperial senate for F., consisting of 18 members, nominated by the emperor, and presided over by the gov.gen. of Finland. The revenue of F. 1902 was $21,200,000; expenditure the same, debt $27,250,000, army (peace) 5,400 men with 20,000 reserves, navy none, commercial marine 2,153 vessels, and manufactories 7,784 with 91,000 hands. Pop. (1851) 1,636,915; (1880) 2,028,021; (1887) 2,232,378, of whom 85 per cent. were of the native Finnish race, 12 per cent. Scandinavians, and the remainder Russians, Germans and Lapps; (1897) 2,592,778.

The early history of F. is shrouded in obscurity, and little is known of the people before the 12th c. when Eric the Saint, King of Sweden, exasperated by their piratical inroads, undertook a crusade against them, and compelled them, by force of arms, to profess Christianity. The hold which the Swedes then acquired over the country was never wholly lost till 1809, when Sweden secured peace with Russia by the cession of all F. and the island of Aland; before that time, however, the Russians had at various epochs wrested portion of the Finnish territories from the Swedes, while F. had been for centuries the perpetual cause and scene of wars between the two nations. The Swedish language had taken such deep root in F., that the efforts of the Russian government to displace it in favor of the native Finnish have hitherto had only partial success, and in many parts of the country, the people still openly prefer their old masters. The inhabitants, who call themselves *Suomes*, and are denominated *Tschudes* by the Russians, have, however, no affinity of race with the Swedes, and may be regarded as differing from all other European nations, excepting the Lapps and the Finmarkers, to whom they are probably allied. See FINNS: FINNISH LANGUAGE AND LITERATURE.—See further, Rein, *Finlands Historia* (Helsingf. 1871); Hallsten *Finlands Historia och Geografi* (1873); Koskinen, *Finnische Geschichte* (Leip. 1873); Armfelt, *La Finlande* (Helsingf. 1874); Ignatius, *Statistiska Anteckningar om Finland* (1876).

FINLAND, GULF OF: eastern arm of the Baltic Sea, between 22° and 30° e. long., and 59° and 61° n. lat. Its coasts are entirely Russian territory. It receives the waters of the great lakes Onega and Ladoga. The water of the gulf is not deep, and only slightly salt. The topography of the Gulf of F., thoroughly elucidated by Struve, forms an interesting part of the great work of the Russian survey of the Baltic.

FINLAY, *fĭn'lĭ*, GEORGE: 1799, Dec. 21—1875, Jan. 25; b. Faversham, Kent, England; of Scottish parents: historian. In 1823 Philhellenism led him to take up his residence in Athens, where he patiently studied the later Greek history. The fruits of his labor and researches are in his *History of Greece under the Romans,* B.C. 146 *to* A.D. 717 (London 1843; 2d ed. 1857); *History of Greece from its Conquest by the Crusaders to its Conquest by the Turks, and of the Empire of Trebizond,* 1204–1461 (London 1851); *History of Byzantine and Greek Empires,* 716–1453 (London, 2 vols. 1853–4); *History of Greece under the Othoman and Venetian Dominion* (1854); and *History of the Greek Revolution* (1861)—all re-edited by H. F. Tozer as *A History of Greece from* B.C. 146 *to* A.D. 1864 (Oxford, 7 vols. 1877). F. threw much new light on modern Greek history. He had profound knowledge also of Greek art, antiquities, and topography. In 1870, he edited Brue's *Journal of Ali Pacha's Campaign in* 1715. He died at Athens.

FINMARK, *fĭn'mârk:* province of Norway, most northern part of the continent of Europe; between 68° 30′ and 71° n. lat., and 17° and 31° e. long., constituting Norwegian Lapland (q.v.); 18,302 sq. m., of which three-fourths are on the continent, the rest on the numerous islands which skirt its n.w. shores, and terminate in the North Cape. Innumerable fiords and bays indent the coast. The interior is intersected by a snow-covered range of mountains, reaching an elevation of 4,000 ft.; the line of perpetual snow being here less than 3,000 ft. above the sea. Agriculture is impracticable above 100 ft.; a few berries are the only fruits that ripen; and though barley, potatoes, and a few other vegetables thrive in some parts, fish and game constitute almost the sole food of the inhabitants. In the north.

where are no trees the turf of the marshes affords good supply of fuel. The thin vegetable mold which covers the stony soil yields grass for the sheep and cows, which graze on the declivities of the rocks skirting the fiords and creeks. The principal source of wealth is the reindeer in the north, and the cod-fisheries in the south. Hammerfest (q.v.), cap. of F. (70° 40′ n. lat.), is the most northern town of Europe. Pop. of F., principally Lapps, a people of Finnish origin (see LAPLAND), in 1880 was 27,000. (1891) 29,110.

FINN, n. *fĭn:* a native of Finland. FINNISH, a. *fĭn'ĭsh,* pertaining to Finland, its language or its people. FINLANDER, native of Finland.

FINNAC, n. *fĭn'nak:* a white trout, a variety of the *Salmo fario.* It is asserted that the fry of this fish have never been seen by the most experienced anglers or salmon-fishers.

FINNED, FINNY: see under FIN.

FINNEY, *fĭn'ĭ,* CHARLES G.: 1792, Aug. 29—1875, Aug. 16; b. Warren, Litchfield co., Conn. He was brought up in Oneida co., N. Y. Having, after a common education, taught school four years, he entered, when 20 years old, a New England high school and, later, learned also some Latin, Greek, and Hebrew. At the age of 26 he began to study law; and turning to the Bible, with special reference to its bearings on legal questions, was led to study it profoundly, and to interpret it as a judge interprets written laws. From the minister whose preaching he attended he heard theological views expressed which he afterwards learned to call very high Calvinism. Whatever he thus received he judged by the Bible, and then debated with his minister freely and earnestly. During this time his interest in personal religion greatly increased. 'If' (he thought), 'there is a future life, I need a change of heart in order to be prepared for it.' Convinced that the Scriptures are the word of God, he accepted Christ as his Savior, renounced the world, and, giving up his cherished legal studies, consecrated his life to the work of preaching the gospel. In connection with this personal experience he received (he says) a 'baptism of the Holy Spirit' which, filling him with overwhelming joy, compelled him to cry unto God that the manifestation might be stayed. Beginning his work in prayer meetings and by personal conversations, he soon became a preacher (1824) and at once found revivals of religion accompanying his ministry. 'The themes of his preaching' (he says) 'were the voluntary, total moral depravity of the unregenerate; the unalterable necessity of a radical change of heart by the Holy Ghost, and by means of the truth; the divinity of the Lord Jesus Christ, his divine mission, perfect life, vicarious death (as an atonement for the sins of all mankind), and his resurrection; repentance, faith, justification by faith, and the doctrines kindred with these. The means used were: simple preaching; much prayer, public and private, as an indispensable condition of promoting the work; conference among Christians; meetings to instruct earnest inquirers;

and personal conversation.' 'It had been' (he further says) 'the common practice to set anxious persons to praying for a new heart, and to using means for their own conversion. This had produced in them the impression that they were willing to be Christians, and were taking pains to induce God to convert them. But I tried to make them understand that God was using the means with them, and not they with him; . . . . . that he was ready and they were not; . . . . . that in praying for a new heart they were trying to throw the responsibility upon God; and their efforts to do duty while they did not give their hearts to him were hypocritical and delusive.' It was under such preaching and personal efforts that those mighty revivals of religion followed which, resulting immediately in the hopeful conversion of thousands, and extending their influences far and wide, formed a striking feature of the half century during which they were continued. Mr. F. visited England 1849 and 58. his preaching in London drew vast crowds and gained a multitude of converts. In 1832 he became pastor of the Second Free Church in New York, and 1834 of the newly organized Congl. Church in that city, known as the Broadway Tabernacle. In 1835 Mr. Finney was chosen prof. of theology and pastor of the church in the college and seminary then founded at Oberlin, O. After 1860, being 68 years old, he gave up his labors abroad, but for 12 years longer, prosecuted with efficiency and zeal his work at home; then, resigning the pastoral office, he continued his seminary duties until his death at Oberlin, at the age of 83 years; 'during 55 of which his life had been a power in the land.' Among his published writings are: *Lectures on Revivals of Religion* (Boston 1835; many editions; enlarged ed. Oberlin 1868); *Lectures to Professing Christians* (Oberlin 1836); *Sermons* (New York 1839); *Lectures on Theology* (Oberlin 1846, new ed. 1878; repub. London); *Memoirs—an Autobiography* (New York 1876).

Mr. F. as a preacher was keen, clear, logical, vigorous, simple, pungent—addressing himself to the conscience. As a 'revivalist,' he urged immediate and public self-committal to God before the whole assembly. Some attendant incidents of excitements and bodily manifestation, with his strong, sometimes almost overwhelming urgency in statement, called forth much criticism as 'new measures.' His theology also was impugned by some leading minds. Whatever basis there was for such criticism, the fact remains that the practical results of his life-work increasingly commended themselves, and gave testimony to that work as bringing to bear on the public mind a remarkably heightening and spiritualizing force.

FIN'NISH LANGUAGE AND LIT'ERATURE: an agglutinative language, with an interesting poetic literature. —The Finnish *language*, like that of the other Ugrian nations, belongs to the Turanian family of languages, and hence offers some striking points of resemblance to the languages and dialects of the Turks, Tartars, Mongols, Mandshurians, Tungusians, and even Magyars or Hungarians. In Finnish, the nouns are not inflected, but an additional word is required to denote the variations of case, number, and sex. The prepositions and pronouns are suffixed to the words which they modify. The verbs have only two tenses, past and present; the future being expressed by adding to the present some word indicating a future action or state of being. Rask considers the Finnish the most harmonious of tongues. Many Swedish, and a few Russian words have, of course, become incorporated with the language, in consequence of the social and political relations of the F. with those two countries. To Elias Lönnrot of Helsingfors belongs the merit of rescuing from utter oblivion some of the numerous sagas and songs which had for ages been recited by the Finnish *Runolainen*, or singers, to the sound of the *kantela*, or harp, and thus transmitted from one generation to another. Although his researches were limited to the district of Karelia, in the govt. of Kupio, he obtained numerous songs and proverbs, and a complete epos, of 32 parts, each containing 200 to 700 verses. This singular monument of the earlier culture of the people was published by him 1835, under the title of *Kalewala* (anc. name of Finland), but it met little notice till the academy of Dorpat made it the subject of discussion at their meetings 1840, and thus attracted the attention of foreign philologists, and led to its translation into Russian, Swedish, and German. The learned Finnish scholar, Carsten, the Grimms, and Brockhaus, agree in regarding the *Kalewala* as a pure epic, and characterize it as a composition possessing a thoroughly Oriental appreciation of nature, an almost unparalleled wealth of images and tropes, great flexibility of rhythm, and a copiousness of synonyms not known in any other northern tongue. There is less unanimity in regard to the character of the plot, for while one critic believes that the incidents refer to definite historical epochs, another regards them as purely allegorical. But whatever discrepancy of opinion there may be in this respect, the *Kalewala* is admitted by all who are entitled to form a judgment of its merits, to be one of the most curious monuments of the kind possessed by any European people. The date of its composition must be referred to a period anterior to the introduction of Christianity among the Finns in the 14th c., while there is even strong internal evidence, from an identity of the names and traditions of the *Kalewala* with many still current in Esthonia, that the poems very probably belong to an epoch anterior to the immigrations of the Karelians into the districts which they now occupy. The publication of the *Kalewala* has given a powerful impetus to the study of the Finnish language, which the Russian government effectively sustains by encouraging the cultivation and use of their native tongue by the Finlanders. The upper classes still cling to the use of Swedish, but the peasantry and small landed proprietors welcome with avidity every addition to the limited stock of their printed literature. Finnish weekly papers circulate freely among them, and political questions are discussed with an enthusiasm never seen among similar classes in Scandinavia or Russia Proper, but which affords additional proof of the difference in character of the Finns from either of the neighboring nations with which they have been successively incorporated.

The prose literature of Finland deals almost exclusively with religious and moral subjects. The Bible was translated into Finnish 1642, but a part of the Old Testament had been translated a century earlier. Several Finnish poets have acquired reputation of late years, but their works breathe the same melancholy tone which so strongly characterizes the ancient poems of Finland. Lönnrot has made a collection of about 7,000 proverbs (*Suomen kansan Sanalskuja*, 1842), and about 2,000 charades (*Suom. kans. arwoituskia*, 1851). In 1880, about 20 journals or magazines appeared regularly in the Finnish tongue, one of them illustrated. See FINLAND: FINNS.

FINNS, *fĭnz:* geographically, inhabitants of Finland; but in ethnology, a considerable branch of the Ugrian race, dwelling for the most part in Finland, though with some representatives in Sweden and Norway also. The Ugrians have been classed among the nations said to have a Mongolian origin. Dr. Latham places them among the 'Turanian Altaic Mongolidæ,' and divides them into Ugrians of the East, and Ugrians of the West. The Western Ugrians consist of Lapps, Finns, Permians, and other nations or tribes in the n. and n.w. of Russia, and of the Magyars in Hungary. The Magyars are the most numerous; and next after these, the Finns numbering abt. 2,000,000. All the other tribes of Western Ugrians together do not comprise as many. The F., in common with the other Ugrians, are of the Mongolian type. A recent traveller, Bayard Taylor, describes them as having 'high cheek-bones, square, strong jaws, full, yet firm lips, low broad foreheads, dark eyes and hair, and a deeper, warmer red on the cheeks than on those of the rosy Swedes. The average height is, perhaps, not quite equal to that of the latter race, Swedes, but in physical vigor, there is no inferiority, and there are among them many men of splendid stature, strength, and proportion.' Other travellers bear similar testimony to the physical appearance of the F. proper, or those of pure Finnish blood; but though these form the majority, there are many, in the towns especially, who pass for F., while in reality, they are quite as much entitled to be called Swedes, or even Russians, on account of the frequent intermarriages of the F. with individuals of those two nations. The F., from having been originally a nomadic race, have for many centuries been stationary and civilized. Long before the arrival of the German and Slavic nations in the north of Europe, the Ugrians, or *Ogres* (for the name so common in fiction is really of historic origin), possessed it, and were gradually pushed further n. and e. by the new invaders. Both F. and Lapps, there is good reason to believe, originally extended much further s. than they do at present, occupying, perhaps, the whole of Sweden and Norway. 'The Finns,' says Prichard, 'were, in the time of Tacitus, as savage as the Lapps; but the former during the succeeding ages became so far civilized as to exchange a nomadic life for one of agricultural pursuits; while the Lapps have ever continued to be barbarous nomades, as well as the Siberian tribes of the same race—namely, the Woguls and Ostiaks. The Finns, as well as their brethren the Beormahs, or Finns of the White Sea, had probably undergone this change long before the time when they were visited by Otther, the guest of Alfred. When the Finns were conquered by the Swedes, they had long been a settled people, but one of curious, and singular, and isolated character.'

The F. of our time are doubtless the same race as the *Fenni* of Tacitus, and the *Phinnoi* of Strabo and Ptolemy, though not occupying the same geographical area. 'The nearest approach to a name at once general and native,' says Dr. Latham, 'is Suomelainen, meaning swamp, morass, or fen people; the term Finn and Finlander being of foreign origin.' With respect to the social habits, morals, and manners of the F., all travellers are unanimous in praising them. They are of cheerful disposition, affectionate toward each other, and honest and honorable in their dealings with strangers. 'They are also cleanly in their persons, being much addicted to the use of the vapor-bath, to which circumstance may be attributed the strongly marked difference in physical appearance between them and the stunted Lapps, to whom, in language as well as many other respects, they stand closely related.

FINOS, n. *fīn'ōs* [Sp.]: in *com.*, the second-best wool from merino sheep.

FINS [see Fin]: organs adapted for swimming or locomotion in water. The limits of the application of the term are rather vague. It is always applied to the locomotive organs of fishes, when they possess special organs of locomotion, as almost all of them do; and equally to those organs (the pectoral and ventral fins) which are homologous to the limbs of other veterbrate animals, and to those (the vertical fins) which may be said to be superadded to them and to belong to fishes alone; equally to those also which are furnished with rays, having a membrane stretched on them, as is generally the case in all the fins of fishes, and to those which consist, as in some fishes, of a mere fold of the skin, and which are scarcely organs of locomotion. The name fins is given to the locomotive organs of *Cetacea*, but not to those of any other *Mammalia*, even when, as in the case of the hind feet of seals, they approach very nearly to the character of the fins of fishes. Nor is it ever given to the webbed feet of birds. But it is often given to the swimming organs of invertebrate animals, as to the expansions of the mantle which serve this purpose in the *Cephalopoda*, and which are entirely destitute of rays.

FINSBURY, *fĭnz'bėr-ĭ:* or Fen Town: parliamentary borough of Middlesex, forming the n. part of London (q.v.).

FIN'SCALE: see Red-eye.

FINSTERAARHORN, *fīn'stėr-âr'hŏrn:* highest peak of the Bernese Alps: see Alps.

FINSTERWALDE, *fīn'stėr-vâl-dėh:* town of Prussia, province of Brandenburg, on an affluent of the Black Elster, 40 m. n. of Dresden. It has manufactures of cloth and machinery: spinning and weaving are carried on. Pop. (1880) 7,300; (1885) 7,566.

FIONS, n. *fī'onz* [Gael. *fein;* Ir. *fion, fians*]: semi-mythical race of warriors of supernatural size, strength, and daring in the poems of Ossian. According to Skene they were of the race which inhabited Scotland and Ireland before the Scots, and Germany before the Germans. According to others, they were Irish, and derived their name from Fion MacCumhal (Fin MacCoul) their leader: see Fenian Society.

FIORD, or Fjord, n. *fĭ-ŏrd'* or *fyŏrd:* in the *Scandinavian tongue*, a name for a bay or inlet of the sea.

FIORENZUOLA, *fē-ō-rĕn-zô-ō'lâ* (*Florentiola*): town of n. Italy, province of Piacenza, 22 m. w.n.w. from Parma, on the Arda: in a beautiful and fertile plain. It is a station on the railway between Parma and Piacenza, and is also on the ancient Æmilian Way. It is well built, and a place of considerable activity. It formerly had numerous conventual and other ecclesiastical establishments. The principal church is still collegiate, and contains some curious relics of ancient art. There are some interesting relics of mediæval times It is supposed to occupy the site of the ancient *Fidentia*. Pop. 6,500.

FI'ORIN: see Bent Grass.

FIORITE, n. *fī'ō-rīt* [from *Fiora*, in Tuscany]: pearl-sinter, a siliceous incrustation not uncommon in the vicinity of hot springs and volcanoes.

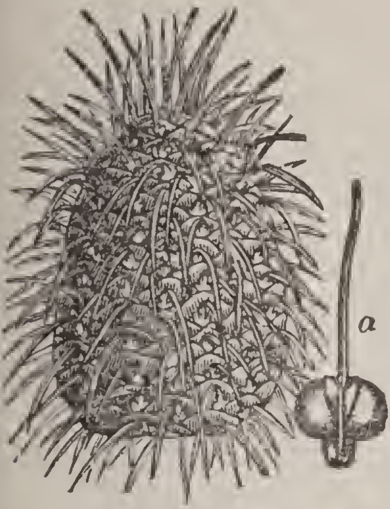
FIPPIL, v. *fíp'pĭl* [etym. doubtful], to whimper; to whine: to act in an unmanly manner.

FIR, n. *fĕr* [Ger. *föhre;* Icel. *fura;* AS. *furh,* fir]: a general name for trees having needle-shaped leaves; *Abĭēs,* the genus of fir-trees, sub-ord. *Abĭĕtin'ĕæ,* ord. *Conĭf'ĕræ;* the *Pinus silves'tris,* ord. *Conĭf'eræ.* FIR-APPLE, a fir cone. FIR-BOB, a fir-cone. FIR CONE, the strobilus or cone-like fruit of the fir. FIR-MOSS, in *bot.*, *Lycopodium selago.* FIR-RAPES, name given by Lindley to the order *Monotropaceæ.* FIR-IN-BOND name given to lintels, well-plates, bond-timbers, and all timbers built in walls. FIR-WOOD, wood of the fir; common deal board.—*Fir* is used often in a sense co-extensive with the widest sense of the word PINE (q.v.), and therefore including a large portion of the CONIFERÆ (q.v.), or at least the whole of the Linnæan genus *Pinus.*

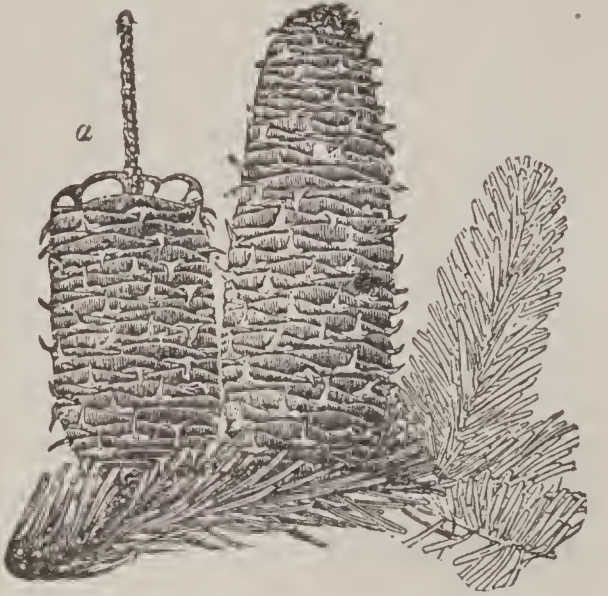
Common, or Norway Spruce Fir (*Abies excelsa*):
Copied from Selby's *British Forest Trees.*

But the name fir is used often also in a more restricted signification; and the trees so designated are those forming the genus *Abies* of some authors, *Abies* and *Picea* of others, which the greater number of botanists have now agreed in separating from *Pinus.* For the SCOTCH-FIR, however, which is a true Pine (*Pinus sylvestris*), described along with its congeners, see PINE. The genus *Abies* is distinguished from *Pinus* by the flat rounded apex of the scales of its cones, and by leaves not in clusters of definite number. Some botanists include the species of LARCH (q.v.) and CEDAR (q.v.) in the genus *Abies;* but if these be separated, no species with clustered leaves remain in this genus, which then contains only the different kinds of SPRUCE

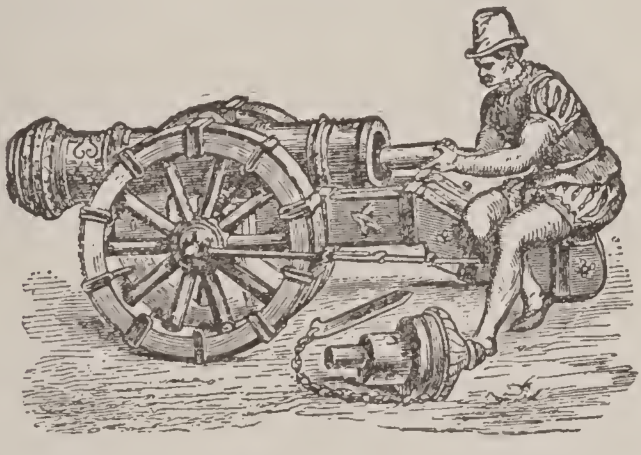
PLATE 19.



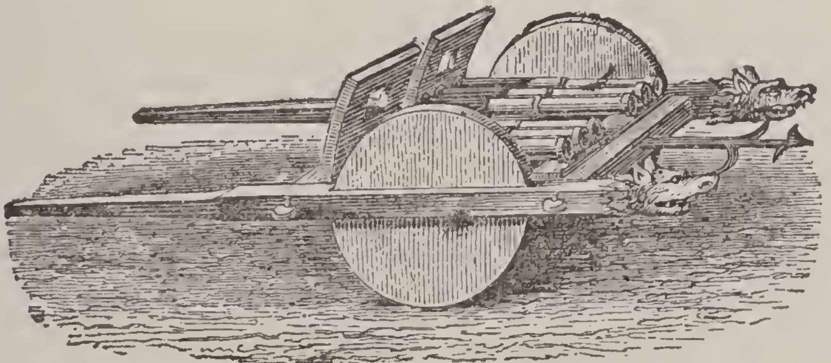
Fir.—Cone of *Abies bracteata:* *a*, Scale of cone, showing bract.



Fir. — Branchlet with cones of *Abies Nordmanniana.* At *a* the scales are supposed to have fallen away, showing the axis.

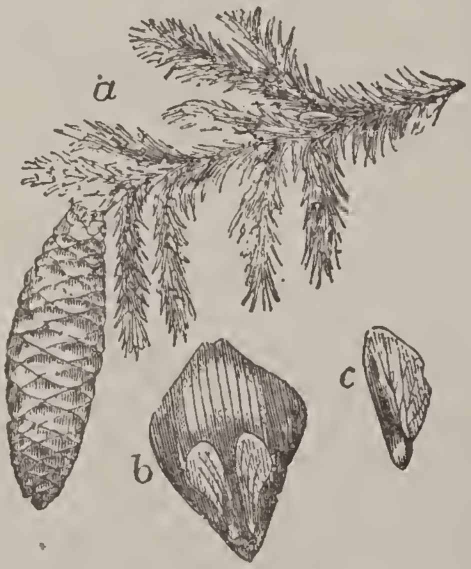


Firearms.—German Breech-loading Cannon of the Sixteenth Century.



Firearms.—French Orgue des Bombardes.

Fir and of Silver Fir, or species most nearly allied to those which ordinarily bear these names. All are evergreen. The Spruce Firs form the genius *Abies* of some authors, distinguished by short solitary leaves, scattered all round the branchlets, and by the scales of the (pendulous) cones being attenuated at the apex, and remaining fixed to the axis of the cone. The Silver Firs form the genus *Picea* of some, distinguished by the deciduous scales of the (erect) cones. It being supposed, however, that the Linnæan names had been given through mistake, and that the common silver fir is the true *Abies* of the ancients, and the Norway spruce their *Picea*, Link has attempted, but without being followed by many, to restore these names to their ancient use, and to denominate the genera accordingly.—The Norway Spruce (*Abies excelsa* or *Pinus Abies*) is a noble tree, sometimes attaining the height of 180 ft. with long cylindrical pendulous cones, denticulate scales, and scattered, green, crowded, suddenly pointed, almost quadrangular leaves. It is the *Fichte* of the Germans, called also *Rothtanne* or *Schwarztanne*. Like the other kinds both of spruce and silver fir, it shows the peculiar character of the *Coniferæ* more perfectly than many of the true Pines do, in its perfectly erect stem, from which proceed almost whorled horizontal branches. It is a very beautiful pyramidal tree, and when old, its long branches droop toward the ground. It forms entire forests in the middle and north of Europe and in Asia, chiefly on elevated ridges, though it prefers moist places. It thrives in districts of primitive rock. In some places, it is found within the Arctic Circle. It is of rapid growth, but is believed to live to the age of 400 years. It yields the same products as the Scotch Fir, resin, turpentine, tar, and lampblack (see these titles); but more resin than turpentine. The true Spruce Rosin flows spontaneously from the bark. The purest pieces are whitish or pale yellow, are sold under the name of **Common Frankincense,**

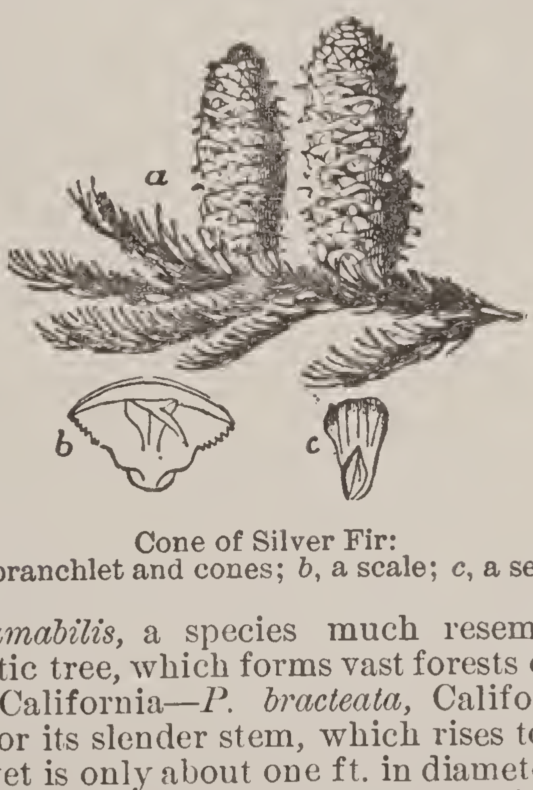


Cone of Norway Spruce Fir:
a, branchlet and cone; *b*, scale, with seeds; *c*, a seed.

and used for ointments and plasters, and when melted yield the common Burgundy Pitch (q v.). The bark of the spruce is a good and cheap non-conductor of heat: the cones are an excellent substitute for tanners' bark. In Sweden and Norway, the inner bark is made into baskets; and the long and slender roots, split and boiled with alkali and sea-salt, are dried, and twisted into cordage, used both for vessels and by farmers. The wood is used for fuel and for house-building; it also supplies masts and spars for ships: it is the WHITE CHRISTIANIA DEAL and DANZIG DEAL of the market, and is very largely exported from Norway and the Baltic. It is whiter, lighter, less resinous, and more elastic than the timber of Scotch Fir. The sapwood, while still in a gelatinous state, is sweet, and is eaten fresh in Sweden and Lapland: and the inner bark, in times of scarcity, is mixed with a little flour or meal of some kind, and baked into bread. The young shoots still covered with their bud-scales are in many parts of Europe used for fumigation. The leaf-buds are employed medicinally in cases of scurvy, rheumatism, and gout. The pollen is often sold by apothecaries instead of the dust of Club-moss or *Lycopodium.*—A very superior variety of this fir is known as the RED NORWAY SPRUCE. Dwarf varieties are cultivated among ornamental shrubs.—THE BLACK SPRUCE (*Abies nigra*), of which the RED SPRUCE (sometimes called *A. rubra*) is regarded as a mere variety caused by difference of soil, and the WHITE SPRUCE (*A. alba*), form great forests in N. America. The Black Spruce is found as far n. as lat. 65°. Both species are now common in plantations in Britain. Both have quadrangular leaves; those of the Black Spruce are of dark glaucous green, those of the White Spruce are of lighter color. The cones of the Black Spruce are short, ovate-oblong, obtuse, and pendulous, with rounded scales ragged at the edge; those of the White Spruce are oval, tapering to a point with entire scales. The Black Spruce is a valuable timber tree, supplying yards of ships, etc., but its planks are apt to split. The White Spruce is smaller, and the timber inferior. From the Black Spruce the *Essence of Spruce* is obtained, useful as an antiscorbutic in long voyages, and used for making spruce-beer. Spruce-beer is made also by adding molasses or maple sugar to a decoction of the young branchlets, and allowing the whole to ferment. From the fibres of the root of the White Spruce, macerated in water, Canadians prepare the thread with which they sew their birch-bark canoes; and the seams are made water-tight with its resin.—From the twigs of the ORIENTAL FIR (*A. Orientalis*), native of the Levant, a very fine clear resin exudes, known by the name of SAPINDUS' TEARS. This fir has very short quadrangular leaves, densely crowed, and uniformly imbricated.—The HEMLOCK SPRUCE of N. America (*A Canadensis*) forms great part of the forests of Canada and of the n. United States, extending northward as far as Hudson's Bay. Its timber is not much esteemed, as it splits very obliquely, and decays rapidly in the atmosphere; but the bark is valued for tanning. The leaves are two-rowed, flat, and obtuse. The cones are scarcely longer than the leaves. The young trees have a very graceful appearance, but the older ones are generally much disfigured by remaining stumps of their lower branches.—*A. dumosa* of Nepal is nearly allied to the Hemlock Spruce.—*A. Douglasii* is a noble tree, attaining a height of 250 ft., which forms immense forests in the n.w. of America, lat. 43° to lat. 52°. The bark, when the tree is old, is rugged, and 6—9 inches thick. It abounds in a clear, yellow resin. The timber is heavy, firm, and valuable; the growth very rapid.—*A. Menziesii,* native of n. California, very similar to *A. Douglasii* in general appearance, also produces excellent timber. —*A Brunoniana,* Himalayan species, forms a stately blunt pyramid 120–150 ft. in height, with branches spreading like the cedar, and drooping gracefully on all sides. It is found only at considerable elevations. The wood is not durable, but the bark is very useful.—The KHUTROW or HIMALAYAN SPRUCE (*A. Smithiana,* called also *A. Morinda* and *A. Khutrow*) much resembles the Norway Spruce, but has longer and more pendulous branches. The wood is white, and not highly esteemed, though it readily splits into planks.—The MOUNT ENOS FIR (*A. Cephalonica*), native of Cephalonia, attaining a height of 60 ft., and a diameter of three ft., yields durable and very valuable timber.—The common SILVER FIR (*Picea pectinata,* or *Abies* or

Silver Fir (*Picea pectinata*):
Copied from Selby's *British Forest Trees.*

Pinus picea) has erect cylindrical cones, 5–6 inches long, and two-rowed leaves, with two white lines upon the under side. It forms considerable forests on the mountains of Central Europe and of N. Asia, and attains a height of 150–180 ft., and an age of 300 years. The wood is white, contains little resin, is very soft and light, and is employed for the ordinary purposes of coopers, turners, and joiners, and in ship and house carpentry, also for making bandboxes and for many fine purposes, especially for the sounding boards of musical instruments. The same resinous and oily products are obtained from the Silver Fir as from the Spruce and Scotch Fir, but of superior quality. It yields the beautiful clear turpentine known as Strasburg Turpentine. Very similar to the Silver Fir, but generally of much smaller size, and indeed seldom much above 30 ft. in height, is the BALM OF GILEAD FIR (*Picea* or *Abies balsamea*), native of N. America from Virginia to Canada. The wood is of little value, but the tree yields CANADA BALSAM (q.v.). Besides these, a number of other species of *Picea* are found in the w. part of N. America and in the Himalaya, some of which are trees of great magnitude, yielding excellent timber, as *P. grandis,* Californian tree 179–200 ft. in height—*P. amabilis,* a species much resembling it—*P. nobilis,* majestic tree, which forms vast forests on the mountains of N. California—*P. bracteata,* Californian species remarkable for its slender stem, which rises to a height of 120 ft., and yet is only about one ft. in diameter at the base —remarkable likewise for the manner in which the middle lobe of each bractea of its cones is produced so as to resemble a leaf—*P. Webbiana,* the HIMALAYAN SILVER FIR, which, in its native regions, fills the upper parts of mountain valleys, and crown summits and ridges at an elevation of more than 10,000 ft., a tree of great size, 35 ft. in girth, and with a trunk rising 40 ft. before it sends out a branch. Other species are *P. Pichta,* native of the Altai Mountains, very nearly resembling the Silver Fir; *P Nordmanniana; P. Fraserii;* etc.—*P. religiosa* is a tall and elegant tree, native of the mountains of Mexico, with slender branches



Cone of Silver Fir:
a, branchlet and cones; *b*, a scale; *c*, a seed.

which are very much used by Mexicans for adorning churches, and with cones shorter than those of any other Silver Fir. *P. Jezœnsis* is a species introduced of late into western lands, from Japan.

FIR'BOLGS: a tribe in the fabulous early history of Ireland, said to have descended from the Nemedians, who, under their leader Nemedius, landed in the island about B.C. 2260; and after 217 years, left it, on account of the oppression to which they were subjected by pirates called the Fomorians. The emigrating Nemedians formed three bands—one went to Trace, and from them the F. descended; a second to the north of Europe or Lochlan, from whom descended the Tuatha de Danann; and the third to Alban or Scotland, from whom sprang the Britons. The F. returned to Ireland in three tribes, one of which more especially bore the name F., the others were called Firdomnan, and Firgailian. The three tribes, however, were under five leaders, by whom Ireland was divided into five provinces. With Slainge, the first Firbolg king, who began to reign B.C. 1934, and reigned only one year, the Irish historians begin their account of the Irish monarchy and list of kings. The F. were driven out, after they had been 36 years in Ireland, by their kinsmen, the Tuatha de Danann, from Scotland, they having previously passed over to that country from Lochlan; and these, in their turn, were expelled or conquered by the Milesians. The most recent investigators of the early history of Ireland regard the story of the F. as having some basis of truth, but no chronological accuracy; the different tribes having long subsisted in the country together, and with varying fortunes as to temporary superiority. See IRELAND.

FIRDUSI, *fēr-dō̂'sē*, or FIRDOWSI, *fēr-dow'sē* (TUSI), ABU'L-KASIM MANSUR: greatest epic poet of Persia: born between 916–940 A.D. (or between 304 and 328 of the Hedjirah), at Shadab or Rizvan, near Tus in Khorassan; died 1020 (or 411 of the Hedjirah). Whether the name Firdusi (from *firdus*, garden, paradise) was given to him because his father (Fachreddin Ahmad) was a gardener, or on account of the 'Paradise of Poetry' which he had created, is matter of controversy. All that is known of his early life is, that when a boy he was very industrious, and that 'he loved to sit for days alone on the bank of a river.' At the age of between 30 and 40, he went to Gazneh, where Mahmud the Gaznewide resided, great admirer and patron of poetry and the arts. Ere long, F. had an opportunity of displaying both his talent and his extraordinary knowledge of ancient Persian history and legendary lore before the sultan himself, who was so pleased with an episode (the story of Sijavush) written by him at his majesty's order, that he at once paid him a gold dirhem for each couplet, and shortly afterward sent him a great number of fragmentary ancient chronicles and histories of Persia, that he might versify them, and thus carry out the task once attempted by Dakiki—viz., to write a poetical history of the Persian kings from the creation of the world to the end of the Sassanide dynasty (A.D. 636)—the reward to be a dirhem a line. F. spent 30 years over the work, and produced the famous *Book of Kings* (*Shah Nameh*), consisting of 60,000 double lines. Without going so far as many critics have gone, we may fairly rank it among the greatest epics of all nations: the *Iliad*, the *Mahabhárata*, the *Nibelungen*. Truth and fiction, history and fairy lore, all the most gorgeous imagery of the East and its quaintest conceits, together with the homeliest and most touching descriptions of human joy and human sorrow, of valor and of love, the poet has formed into one glowing song. Though abounding—in strict adherence to its sources—in impossibilities and anachronisms (such as Alexander the Great being a Christian, Ki-Khosroo holding the Zend Avesta in his hands—120 years before it was brought to light—Abraham being Zerdusht, etc.), it yet contains not a little of real historical value, quite apart from its being the most faithful mirror of its own times: see SHAH NAMEH. But while F. was 'weaving his poetical carpet,' his enemies had not been idle. Unable to attack his genius and his honesty, they attacked his religious opinions; and the sultan, influenced by bigotry and avarice, sent the poet, instead of 60,000 dirhems of gold, so many dirhems of silver. F. was at a public bath when the messenger arrived with the money, and on discovering that it was silver and not gold, that Mahmud had sent him, he divided the amount into three portions, and gave one to the attendant at the bath, another to the messenger, and the third to a man who brought him a glass of sherbet. He then burned several thousand verses which he had written in praise of the sultan, as sequel to the *Shah Nameh*, and composed one of the bitterest satires against him, which he handed over, well sealed, to the king's favorite slave, to give it to him when he might be seized with one of his fits of despondency, as it contained a beautiful panegyric on him. Dreading the sultan's rage, he fled precipitately, first to Tus; persecuted there, he went to Bagdad, where Kadir Billah, the caliph, received him with all honor. But the unrelenting anger of Mahmud followed him thither, and he removed to Tabaristan, which again he had to leave, seeking another refuge. After eleven years of restless wanderings, he was at last allowed to return to his native place, a broken, wretched old man. Mahmud is said to have repented his cruelty at last, and to have sent a caravan loaded with the costliest goods to F., to entreat his forgiveness, and induce him to become once more the star of his court. But while the king's messengers entered one gate of the city, F.'s bier was carried out to his last abode by the other. His only daughter—an only son of his had died long before him at the age of 37 years—refused the sultan's present, and certain buildings were erected instead, in honor of the dead poet.

The great popularity which the *Shah Nameh* has always had in the East, is to a certain amount also the cause of the uncritical state of the texts. Every transcriber shaped and molded certain passages, or even episodes, according to his own fancy, so that not two out of the innumerabl copies are quite alike. Nor are the 60,000 couplets extant in any one instance, the utmost number, including all th most palpable interpolations, never exceeding 56,600. The first complete edition of the text, with glossary and introduction, was published by Turner Macan (Calcutta, 1829, 4 vols.). Another was published by Mohl (Paris 1838–68, 6 vols.), with a French translation, which latter was reissued separately 1876–7. F. wrote another poem, *Yusuf and Zuleikha*, which has been edited by Morley, and a *Divan*, or collection of poems. See Miss Zimmern's translation of the *Epic of Kings* (with introduction, 1882); also the works of Hammer, Wahl, Görres, Morley, Ouseley, Atkinson, etc.

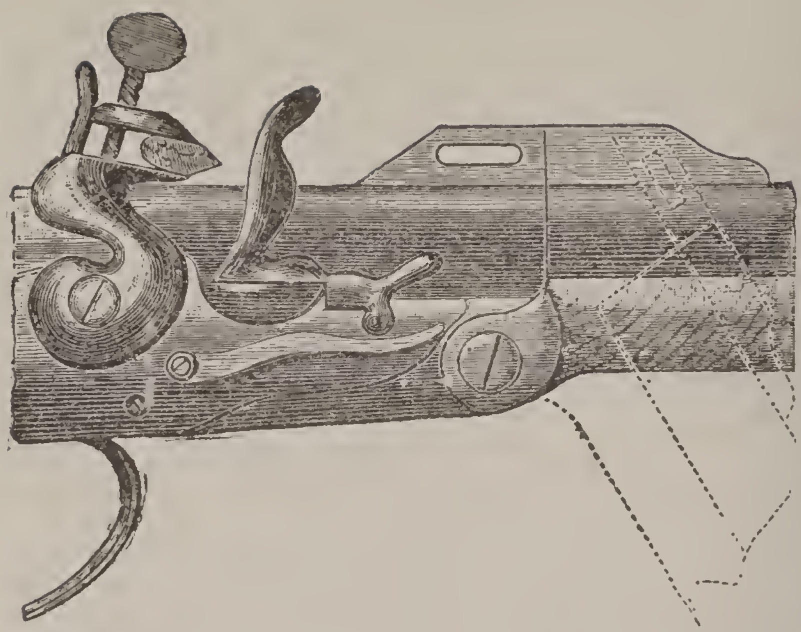
FIRE, n. *fīr* [Ger. *feuer;* Icel. *fyri;* Sw. *fyr;* Gr. *pur*, fire: comp. Gael. *faire,* to watch, a watch-fire]: the result of the combustion or burning of bodies, as coal, wood, etc.; a conflagration; severe trial or affliction; flame; lustre; the burning fuel in a grate; anything which inflames the passions; ardor; rage; animation: in *armorial bearings*, denoting those who perform brave actions with ardent courage, their thoughts always aspiring as the fire tends upward: V. to kindle; to set on fire; to take fire; to become irritated; to discharge firearms. **Fi′ring**, imp.: N. fuel; the setting on fire; discharge of firearms. **Fiery**, **Fieriness**, **Fierily**: see these titles. **Fired**, pp. *fīrd*. **Firearms**, n. plu. cannon, rifles, etc. (see below). **Fire-ball**, meteor resembling a ball of fire passing rapidly through the the air; projectiles (see below). **Fire away**, *familiarly*, go on as quickly as possible. **Fire-blast**, a disease to which the hop-plant is liable. **Fire-bote**, in *English law*, right of a tenant for life or for years, to cut wood on the estate for fuel (See Estover). **Fire-box**, in a *locomotive engine*, box in which the fire is placed. **Firebrand**, piece of burning wood; an incendiary; one who provokes quarrels. **Fire-brick** (see Brick), and **Fire-clay**, so called from their power of resisting the wasting effects of fire (see Fire-clay, below). **Fire-brigade**, organized body of men for extinguishing conflagrations in towns. **Fire-damp**, inflammable gas, light carburetted hydrogen see Methane issuing from the crevices in mines (see Gas). **Fire-eater**, one who pretends to eat fire; a fighting character. **Fire-eating**, see below **Fire-guard**, wire fencing in front of a fireplace. **Fire-irons**, the poker, shovel, and tongs. **Fireman**, one who tends an engine or assists in putting out fires. **Fireplace**, the recess in the wall of a room fitted with a flue, in which a grate for fire may be placed. **Fire-plug**, street water-plug. **Fire-policy**, the authorized document setting forth the nature and extent of the property insured against fire, the sum to be paid under it in the event of fire, and the annual premium payable by insurer (see Insurance). **Fire-proof**, incombustible (see Fire-proof Buildings: Fire-proofing). **Fire-screen**, light movable frame for placing before a fire, partially to intercept its heat or light. **Fireside**, one's own home; the domestic hearth. **Firestone.**

any stone which stands heat without injury. Fireworks, preparations of gunpowder for displays on occasions of rejoicing (see Pyrotechny). Fire-worship, worship of fire practiced by the Parsees (see Sun and Fire Worship): for various *superstitions* connected with fire, see Beltein: Need-fire. Fire-worshippers: see Guebers: Parsees. Greek-fire, inflammable material that could scarcely be extinguished—used first by the Greeks in the 7th c. St. Anthony's fire, disease called erysipelas (q.v.). Curved fire, from a gun so elevated as to cause the projectile to follow a considerable curve. Direct fire, from a gun pointed straight at the object fired at. Enfilade fire, from a gun fired in the direction of the length of a parapet or a line of the enemy's soldiers. Flanking fire, from a gun fired nearly parallel to a parapet, or to the front of a body of soldiers. Oblique fire, striking the object in a slanting direction. Reverse fire, striking the rear of a parapet or body of soldiers. Ricochet fire, from guns fired with small charges and slight elevations so as to cause a ball to make a series of short bounds. Vertical fire, from a mortar with a very high elevation in order that the shell may fall more or less vertically or straight downward. —Syn. of 'fire, n.': blaze; ignition; combustion; splendor; brilliancy; zeal; love.

FIRE, Ordeal by: see Ordeal.

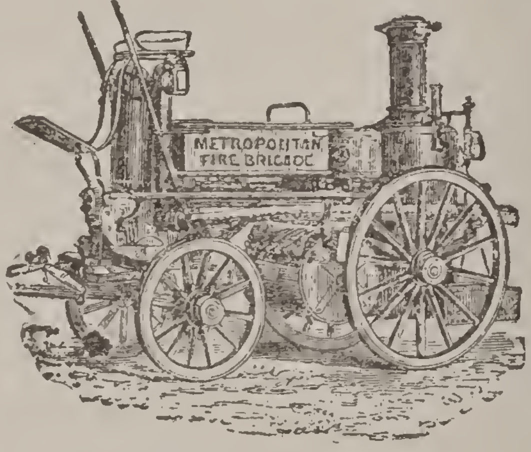
FIRE ALARM TELEGRAPH: a system of telegraphy for conveying a designated signal from the locality of a fire to the engine houses of a fire department. Many patents have been issued for systems or parts thereof, and in their details the apparatus used is quite complicated. The system in use in the city of New York illustrates the general features. Throughout the city alarm boxes are established upon street corners. Each box contains an automatic key, which when pulled or moved sends a signal through an ordinary telegraph circuit to a central office. The signal varies for each box, and consists of a series of taps so ordered as to represent a number different for each box: thus .. .. meaning 223, etc. When a fire occurs the switch in the nearest box is pulled and the approximate locality of the fire is thus telegraphed to the central office. To avoid error the switch repeats its signal five separate times. In the central office the signal is rung out, and is printed on a strip of paper five times, and a shutter is dropped giving the group or circuit number including the box. From the office two other sets of circuits run to all the engine houses. When the operator receives the first alarm he at once throws one set of these circuits into the alarm circuit. The signal is then automatically sent to all the engine houses in the city. Not only is the number rung, but the same current releases the horses by an electric detent mechanism. Should there be any trouble in thus transmitting the alarm a third series of circuits are provided by which gongs in all the engine houses can be rung by hand from the same central office. The five repetitions of the signal, the printing of the signal on paper, and the two independent alarm circuits provide for every

PLATE 20.

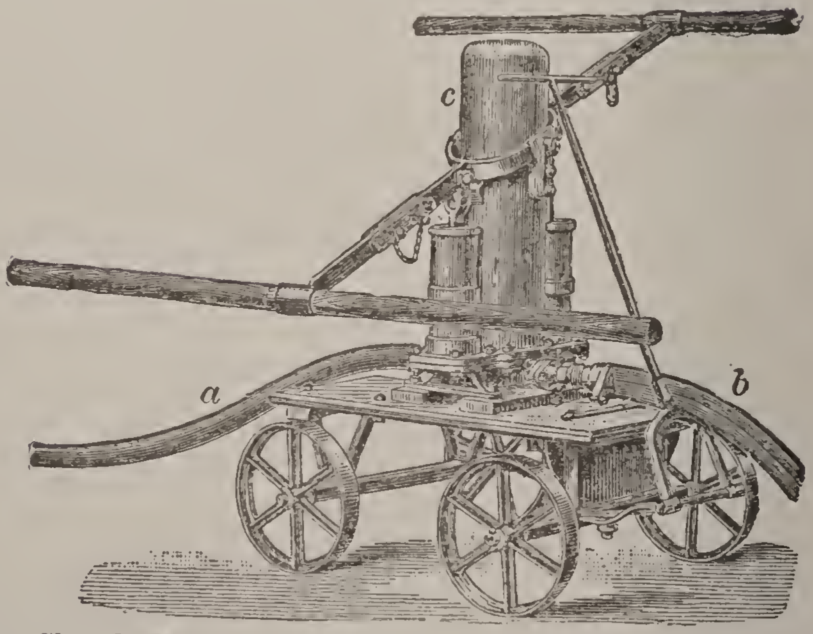


Firearms.—French Flintlock Breech-loader of the Eighteenth Century.

Firearms.—Early Matchlock Gun.



Steam **Fire-engine.**



Messrs. Shand, Mason & Co.'s Railway Platform **Fire-engine:** *a*, Supply or suction pipe; *b*, Discharge or delivery hose; *c*, Air-chamber.

contigency or accident that is likely to occur. In some cities the alarm boxes are not locked and are accessible to everyone: it is found that they are not tampered with. In other cities they are locked and keys are distributed throughout the city. Each box contains also an ordinary hand-key so that the officer in charge at a fire can send special signals for assistance to the central office, to be transmitted thence to the engine houses. Each time an alarm is sounded in New York every fireman in the engine houses is awakened and at his station, and every horse is hitched to the engine or other apparatus.

Automatic Fire-detector. A signalling system worked automatically by elevation of temperature is applied to buildings. It may be electrical or mechanical: the first is the favorite. A tube containing mercury may be so arranged that the expansion of the mercury when heated will complete an electric circuit. A number of such tubes with corresponding circuits could be arranged through a building. A bell could then be arranged to be rung on such completion of the circuit. Following these lines numerous variations have been proposed and adopted. Mechanical alarms may sound by the burning of a string, fusing of a fusible alloy, etc., which is made to start a bell mechanism giving a prolonged alarm.

FIRE AND SWORD, Letters of: in the law of Scotland, anciently directed by the privy council to the sheriff, authorizing him to employ force to bring an accused criminal before the court, or to carry out the decree of a court, when there was resistance. By the modern practice in almost all countries, the judge may, of course, always call in the aid of the military to apprehend an accused party, or to enforce a degree where the ordinary means have proved unavailing.

FIRE ARMOR: protective devices for firemen; in many varieties. The cumbrous nature of the majority has militated against their introduction. In one class a bag or vessel containing pure air is attached to and carried by the fireman. From this vessel a tube is carried so as to communicate with the mouth or nose, giving an independent supply of air. An air-tight helmet may receive the air. In this case the air is inspired through the nose and expired through the mouth. Sometimes no helmet is used, and the end of the air tube is held in the mouth; the wearer breathes in through his mouth and out through his nose. A light valve is adapted to the latter to prevent inhalation of smoke. In a second class of armor, air is supplied from outside the burning building. The armor includes a helmet to which one end of a long hose is attached. The other end of the hose remains outside of the building, and through this hose the fireman's companions force air by means of a bellows or its equivalent. In a third class a filtering medium is depended on to purify the air. The *fireman's respirator* is of this order. It has been found that wet tissues have a wonderfully efficient action in purifying air contaminated with smoke. A mask glazed and fitting tightly over the eyes protects them from the irritating effects of such air. The lower part of the mask holds wet sponge firmly in place over the mouth and nostrils: through this the air is inhaled. This simple apparatus has proved wonderfully efficient. For protection of the body, ordinary methods not needing description are used. Apparatus of the first class has been prescribed for use in the New York city fire department, but has been practically abandoned. Armor of the second class has been used in France and the respirator has been adopted quite extensively in the western territories.

FIRE'ARMS: implements—usually hollow cylinders, but of whatever form—used in the propulsion of shot, shell, or bullets, to a greater or less distance, by the action of gunpowder or other material exploded by ignition within them. At a more advanced period, an obvious division of the subject into cannon, mortars, and small-arms presents itself; but relative to the infancy of the invention, and amid the obscurity enshrouding it, the natural inquiry is into the origin of F. generally: this includes the invention of gunpowder, since that bears directly on the gradual introduction of F. The widely prevalent notion that gunpowder was the *invention* of Friar Bacon, and that cannon were used first by Edward III. of England. must be discarded. It is certain that gunpowder differed in no conspicuous degree from the *Greek fire* of the Byzantine emperors, nor from the *terrestrial thunder* of China and India, where it had been known for many centuries before its application in modern European warfare.

'Nitre,' says Sir George Staunton, 'is the natural and daily produce of China and India; and there, accordingly, the knowledge of gunpowder seems to be coeval with that of the most distant historic events.' The earlier Arab historians call saltpetre 'Chinese snow' and Chinese salt;' and the most ancient records of China itsely show that, when they were written, fireworks were well known, several hundred years before the Christian era. From these and other circumstances, it is indubitable that gunpowder was used by the Chinese as an explosive compound in pre-historic times; when they first discovered or applied its power as a propellant, is less easily determined. There is an account of a bamboo tube being used, from which the 'impetuous dart' was hurled a distance of 100 ft.: this was at a very early but unascertained period. It is, alleged however, that in the century before the Christian era a cannon was employed, bearing the inscription: 'I hurl death to the traitor, and extermination to the rebel.' This must almost necessarily have been of metal. We have also curious evidence in regard to the armament of the Great Wall; for Capt. Parish, who accompanied Lord McCartney's mission, reported that 'the soles of the embrasures were pierced with small holes, similar to those used in Europe for the reception of the swivels of wall-pieces. The holes appear to be part of the original construction of the wall, and it seems difficult to assign to them any other purpose than that of resistance to the recoil of fire arms.' This surmise seemed to carry back the use of gingals to B.C. 200; but it is now known that the great part of the wall dates from A.D. 15th c. Stone mortars, throwing missiles of 12 lbs. to a distance of 300 paces, are particularly mentioned as employed A.D. 757 by Thang's army; and in 1232, it is incontestible that the Chinese besieged in Caïfongfou used cannon against their Mongol enemies. Thus, the Chinese must be allowed to have established their claim to an early practical knowledge of gunpowder.

It has been asserted on doubtful grounds, that the principles of F. reached Europe from India, and that India has equal claims with China to the first acquaintance with the art. The ancient Sanscrit writings appear to point plainly to the operation of some primitive sort of cannon, when, in recording the wars of the Egyptian Hercules in India, it is stated that the sages remained unconcerned spectators of the attack on their stronghold, till an assault was attempted, when they repulsed it with whirlwinds and thunders, hurling destruction on the invaders; and a Greek historian of Alexander's campaign testifies that the Hindùs had the means of discharging flames and missiles on their enemies from a distance.

These Indian philosophers seem, from the writings of Ctesias and Ælian, to have possessed also an unquenchable fire similar to that employed later by the Greeks. Passing from these very early times, in which there is reason to believe that some sort of great gun was employed, we come to the comparatively recent date, 1200, when their use is established beyond a doubt, for Chaséd, the Hindu bard, writes (stanza 257) that the culivers and cannons made a loud report when they were fired off, and that the noise of the ball was heard at the distance of about ten coss, which is more than three-quarters of a mile. In 1258, the vizir of the king of Delhi went forth to meet the ambassador of Hulaku, the grandson of Genghis Khan, with 3,000 carriages of fireworks (in the sense of weapons, probably a sort of rude muskets). In 1368, 300 gun-carriages were captured by Muhammed Shah Bahmiani. The use of cannon had so far advanced in India by 1482, that they were even used for naval purposes: shells having been employed two years earlier by the sovereign of Guzerat. In 1500, the Portuguese had matchlockmen to contend with, as well as heavy ordnance. Pigafetta, 1511, found the town of Borneo defended by 62 pieces of cannon mounted on the walls. So much for the antiquity, and apparently common use of firearms in China and India, at times long antecedent to any knowledge of them in Europe, and during the later period at which they were scarcely developed in an effectual degree. Most of the pieces discovered in India, and supposed to be of early manufacture, are composed of parallel iron bars welded together, and very often they had a movable breech-piece. The knowledge of gunpowder and firearms may be presumed to have extended in a westerly direction through the Arabs, whom we find using them possibly in 711, under the name of *manjaniks*, and certainly very early in the 14th c. The Byzantine emperor, Leo, introduced 'fire-tubes' between 890–911, for use in connection with Greek fire: and there can be little doubt that these were a species of cannon, probably of small bore. In Spain, both Moors and Christians used artillery as early as the 12th century.

Friar Bacon was conspicuous among his contemporaries for his general learning, and we have no evidence to show whether he discovered the ingredients of gunpowder independently of foreign aid, or whether he derived the knowledge from some ancient manuscripts; the latter, however, seems more likely, as Sir F. Palgrave brought to light in the Bodleian Library a letter from a Spanish friar, Brother Ferrarius, contemporary of Bacon, in which the materials of Greek fire are detailed, differing only in proportions, and in these but slightly, from real gunpowder. That the latter was identified of old with Greek fire, is shown by the name 'Crake,' applied to the first cannon used. This word, which still survives in 'cracker,' is pointed out by Sir F. Palgrave to be nothing more than a Norman corruption of 'Grec.' Bacon's announcement dates from 1216; but the powder of his time, as made in the West, was not readily explosive, since the materials were but roughly cleared of impurities, and then mixed together on a slab; and probably little use could be made of it as a propellant until the process of granulating had been introduced by Bertholdus Schwartz 1320. Immediately after this discovery, cannon of small size appeared in the armory of almost every state, as if their use had been known previously, though no practical effect had been given to the knowledge, on account of the inferiority of the powder manufactured. These cannon generally consisted of a smaller barrel or chamber to receive the charge, which fitted into a larger one containing the projectile (see fig. 1). It may be safely assumed that these weapons, though terrifying from their noise, were not very harmful—at least to the enemy. In 1326, the Florentine republic ordered the making of iron shot and cannon for the defense of its villages. In 1327, Edward III. used 'crakeys of war' against the Scotch; in 1339, ten cannons were employed in the siege of Cambray. By 1346, various improvements had been made; and we find in the same year the consuls of Bruges witnessing experiments by one Peter, a tinman, who had constructed a cannon with a square bore, to throw a cubical shot of about eleven pounds; his bolt passed both walls of the town, and unfortunately killed a man on the other side. We have the authority of Villani for believing that Edward III. had three cannon at Crécy; but the cannon then made were, from the little knowledge of casting, limited to about the size of modern duck-guns, and, as has been remarked, three very inferior muskets could have had but little to do with putting 50,000 men to flight.

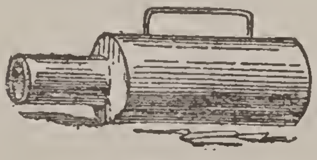


Fig. 1.
From the Santini Manuscripts.

Till this time, European ordnance had been kept back by the rarity and high prices of sulphur, saltpetre, and iron, the last having been so scarce in England, that it was thought necessary to forbid its exportation by a statute of 28 Edward III. Still, crude as was their form, and small their number, firearms had established a firm footing in Christendom; their mission of civilization, and, paradoxical as it may appear, of humanity, had begun. With the first killing discharge, the doom of feudalism had gone forth. Plated armor no longer availed against the weapon of the peasant; and the mailed chivalry, the sinews of previous battles, who had trampled with their iron heels upon popular rights, no longer could carry all before them, but, like other soldiers, were now as loath to be slain by unseen foes as the veriest villain in the host. The people discovered their powers of contending with the noblesse; by degrees, they rose for liberty, and suppressed the tyrannies of the petty lords who had long held them as mere bondsmen In war, again, as artillery became more general, so the slaughter of battles diminished, for an army outmaneuvered was an army at the enemy's mercy, and therefore beaten; whereas, previously, in the hand-to-hand fights where victors and vanquished mixed pell-mell in single combat, a victory could only be really won when there were no foes left to slay. A battle as great as that at Crécy might now be gained with a loss to the vanquished of not more than 1,000 men, instead of the 30,000 who are said to have fallen victims to the English sword or bow.

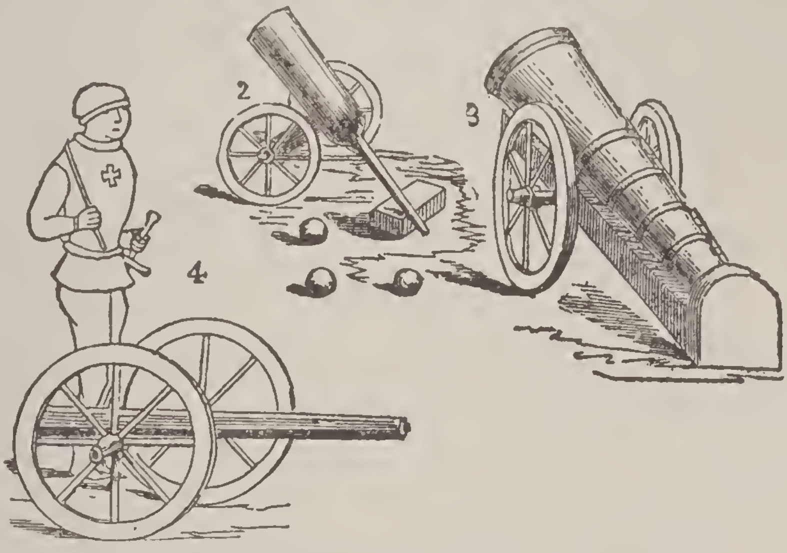


Fig. 2, from the *Chroniques de St. Denis*, Fourteenth Century. Fig. 3, Bombard of the Fifteenth Century, from Froissart. Fig. 4, Cannon of the Fifteenth Century, from *Les Vigiles de Charles VII.*

Dating from the reign of Edward III., the employment of cannon and bombards in siege operations became general. Froissart records that the Black Prince took bombards, cannon, and Greek fire to the reduction of the castle of Romozantin 1356, but it does not appear that he availed himself of F. at the battle of Poitiers in the same year. The bombards seem to have been short, capacious vessels, from which stone balls were shot with small charges to a short distance, and at considerable elevation; they were essentially the parents of the present bombs or mortars (see fig. 2). The cannon (*canna.* a reed), on the other hand, were, for some time at least, of extremely small bore, scarcely larger than muskets of the 18th c.; they discharged leaden bullets, and would have probably been used as hand-weapons, but for their cumbrous and heavy workmanship, which necessitated small carriages. Arms of this description are doubtless those referred to as brought by Richard II. to the siege of St. Malo, to the number of 400 pieces, where they are said to have kept up an incessant fire day and night on the town *without* success.

In the 15th c., armies for siege operations were usually accompanied by great and small guns, the latter being intended to keep down the fire of the besieged while the large bombards were being loaded, an operation requiring no small time. These guns were gradually improved, but it was not until the reign of Henry VIII. that the founders succeeded in casting iron ordnance to the entire exclusion, until quite the present day, of cannon formed of square or rounded bars welded together. England had even then become famous for the workmanship of its ordnance. The accompanying sketch (fig. 5) of a gun found in the wreck of the *Mary Rose*, which sank at Spithead in the above king's reign will show that a degree of excellence had been attained in the manufacture of artillery, little inferior to that which has lasted till our own day when rifled ordnance are rapidly superseding cannon of smooth bores. Still, so late as Henry's reign, though great guns were found very serviceable in siege and naval operations, where the defenses of those days offered but a trifling resistance to their power, they appear to have been looked upon rather as an encumbrance than an advantage with armies in the field. This is attributed partly to the heavy character of the guns themselves, and especially of their carriages, but more particularly to the badness, or rather absence, of the necessary roads for their transport. In 1522, it is recorded in the state papers that the ‘ kinges ordonauns [were] unable to pass over Stanes More toward Carlile.’

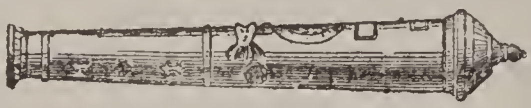


Fig. 5.

As time passed, the details of the manufacture were improved, the general principles remaining the same; the size of the guns increased, while the proportionate weight of the carriages diminished; limbers (q.v.) were added, and the equipage of a gun gradually perfected and lightened. With increased calibre, to which augmented range was usually added, the number of cannon—at one period enormous—taken with an army was by degrees reduced, until now a certain standard proportion between artillery and infantry is ordinarily maintained. Three guns to a thousand infantry is the proportion now considered best. Of course, this proportion differs with the opinions of various commanders; but the greatest modern generals have always acted on the maxim, that it is wasteful to send a soldier on any duty of danger which a ball can be made to perform. As a weapon of offense, Vauban doubled the utility of heavy ordnance when he applied the Ricochet (q.v.) system of firing. Napoleon may almost be said to have won his battles by artillery, for he rarely if ever brought his infantry into action except as supports, until a way had been opened for them, or a panic caused, by the massed fire of large batteries of guns. The Duke of Wellington also devoted the greatest attention to his ordnance train; while, referring to recent events, the campaigns of Lord Clyde in India were remarkable instances of the use of artillery being pushed with abundant success to its greatest limit. During the Franco-German War 1870–1, the Prussians made good use of their numerous breechloading artillery; and cannon were brought to high efficiency by both armies in the great war of secession in the United States.

Cannon of widely varying bores have at different times been cast, and the various sorts became so numerous in continental armies, as at one time to cause much inconvenience from the large quantities of ammunition which it was necessary to carry. Gustavus Adolphus set the example of reducing his guns to a few standard calibres, and this example was soon followed systematically by the French and other armies. The introduction of rifled guns of late years has limited the classes in use in the British army to the following: *Muzzle-loaders*—17-inch, 100 tons; 16-inch, 80 tons; 12·5-inch, 38 tons; 12-inch, 35 tons; 13·5-inch, 23 tons; 12-inch, 25 tons (' Woolwich Infants '); 11-inch, 25 tons; 10-inch, 18 tons; 9-inch, 12 tons; 8-inch, 9 tons; 7-inch, 7 tons, 6½ tons, and 90 cwt.; 80-pounder of 5 tons; 64-pounder; 40-pounder; 25-pounder; 16-pounder; 9-pounder; 7-pounder (steel) mountain-gun. *Breech-loaders*—7-inch, 64-pounder, 40-pounder, 20-pounder, 12-pounder, 9-pounder, 6-pounder. See CANNON, CARRONADES, GUNNERY, HOWITZER.

The mortar differs from all other guns in its solidity of form, its shortness, and its large bore. The object is the projection of shells by a more or less vertical fire, with the intention of breaking through and destroying, by weight and explosion together, roofs of magazines, public buildings, and so on, or of sinking a shell deep into earthworks of a fortress, in which it shall explode as a most deadly mine. For the different sorts, see MORTAR. The mortar was developed naturally out of the old bombard, and doubtless deviated by degrees more and more from the cannon. Fig. 6 shows a bombard or mortar designed in the 15th c. In very early days, we read in Arabian authors of a cylinder hewn in the rock at Alexandria, and used as a mortar. Such a cylinder, and of large size, is still to be seen at Gibraltar, where it was employed in the last siege against the

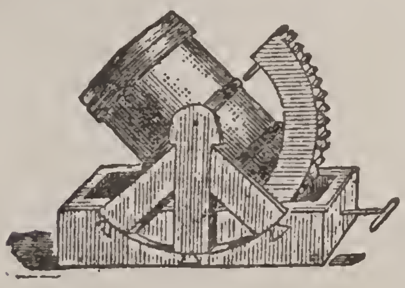


Fig. 6.
From Leonardo da Vinci.

Spanish, when it was made to discharge volleys of large stones, which spreading at times to a distance of 500 yards, constituted a formidable means of defense. In recent years, nearly all guns fire shells, so that the specific necessity for mortars has greatly diminished.

A gun is a frustrum of a right cone, with a cylinder (bore) removed around the axis; from which it follows that the thickness of metal is greatest at the breech, where it has to withstand the effect of ignited powder in its most condensed, and therefore most powerful state. Guns are cast first in loam or dry sand, then turned to the required shape, lastly bored with the minutest accuracy. Formerly, they were cast with the bore already formed; but the direction was rarely exactly correct, and the surface scarcely ever strictly even. See GUN-FACTORIES, ROYAL: for the science of artillery, GUNNERY. See also ARMSTRONG: LANCASTER GUN: KRUPP'S STEEL.

As to *small-arms:* in the 15th c., the smallest sort of cannon were probably at times mounted and used as hand guns. From this the step to the arquebus was rapid; that weapon developed as years passed into the clumsy matchlock; that into the firelock and flint-musket; then the percussion-musket; and lastly, into the beautiful rifles of our own day, which have culminated in the central-fire breechloaders. For diminutives, small arquebuses were made to do duty as horse-pistols; genuine pistols succeeded them; these were gradually improved and reduced in size, till they have culminated in the saloon pistol, available for a waistcoat-pocket, and the deadly revolver. See ARQUEBUS: MATCHLOCK: MUSKET: PISTOL: REVOLVER: RIFLED ARMS: BREECHLOADING GUNS: also LOCK.

Many valuable works have been written on fire-arms from the days of Leonardo da Vinci and Tartaglia to the present. See Louis Napoleon's *Etudes sur le Passé et Avenir de l'Artillerie;* Jervis, *Our Engines of War;* Straith, *Treatise on Artillery;* Chesney, *On Firearms;* Greener, *The Gun and its Development* (1880); and the works of Reinaud and Favé.

FIRE'ARMS, PROVING OF, in Law: required in England, in consequence of the frequency of accidents from the bursting of insufficient barrels. A Royal Charter granted 1637 to the London Gunmakers, gave them powers to search for and prove and mark all manner of hand-guns and pistols. Later statutes rendered the proving of firearms compulsory. All have been superseded by 'The Gun-barrel Proof Act, 1868' (31 and 32 Vict.), regulating the duties and powers of the proof-houses in London and Birmingham (the only two in England). The statute does not extend to Scotland or to Ireland, and arms manufactured for her majesty are exempted from its operation.

FIRE'BALLS: projectiles occasionally discharged from guns or mortars, for the purpose either of setting fire to, or of merely illuminating some work, against which hostile operations are directed. The usual ingredients are—mealed powder, 2; saltpetre, 1½; sulphur, 1; rosin, 1; turpentine, 2½; with pitch, tow, naphtha, etc., as circumstances dictate. The use of F. has been mostly superseded by the introduction of rockets (q.v.), and incendiary shells (q.v.). Akin to the fireball, was the *fire-arrow* of ancient warfare, which consisted of tow steeped in pitch, rosin, or some inflammable mixture, wrapped round the shaft, and fired alight among an enemy's works or troops. Greek fire also was discharged on large arrows surrounded by tow, and was shot from *balistæ*.

FIRE'CLAY: variety of clay employed in the construction of gas-retorts, glass-pots, firebricks, crucibles, etc., which require to withstand high temperatures. It is found chiefly in beds in the coal measures; and the more famous kind is from Stourbridge, England. The principal constituents of F. are silica and alumina, accompanied by small proportions of iron, lime, magnesia, water, and organic matter, as is shown in the following table:

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Silica	64·10	51·10	48·55	69·25	83·29
Alumina	23·15	31·35	30·25	17·90	8·10
Oxide of Iron	1·85	4·63	4·06	2·97	1·88
Lime	....	1·46	1·66	1·30	
Magnesia	0·95	1·54	1·91		2·99
Organic Matter and Water	10·00	10·47	10·67	7·50	3·64

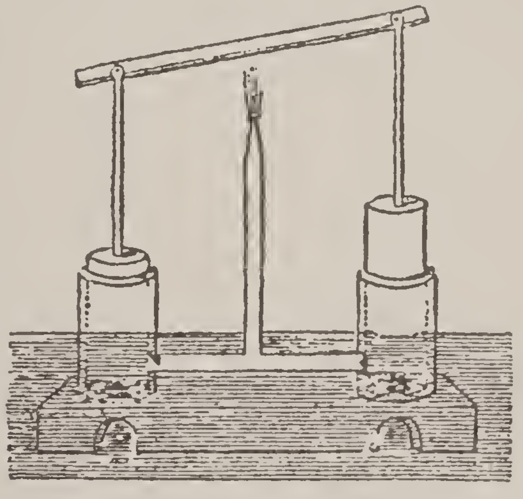
F. is found abundantly, near and at the surface of the ground, and is readily reduced to powder by travelling wheels. When kneaded with water, and fashioned into vessels and other articles it is dried, and then generally subjected to a strong heat, which drives off the water and organic matter, causes the silica to unite more firmly with the alumina, etc., and leaves a more or less porous material, which can withstand very high temperatures. The Passau crucibles are merely dried, and are not fired like Hessian crucibles and other F. wares. The larger the percentage of silica (sand) in the clay, the more refractory are the articles fashioned from it; and hence sand is often added to clay to increase its fusing point and refractory powers; but a certain proportion of alumina, etc., is required to serve as a flux, to cement and hold together the particles of sand. The proportions of sand and clay are determined by the temperature to which the manufactured article is intended to be exposed; and the F. of crucibles or bricks, which are serviceable at a comparatively low temperature, as in the lining of limekilns, would become soft, and yield in glass or porcelain furnaces.

FIRE-EATING: popular term for a variety of feats performed by jugglers with flaming substances, melted lead, red-hot metal, etc. Evelyn, writing 1672, Oct. 8, thus describes F. in his day: 'I took leave of my Lady Sunderland. She made me stay dinner at Leicester House, and afterward sent for Richardson, the famous fire-eater. He devoured brimstone on glowing coals before us, chewing and swallowing them; he melted a beer-glass, and eat it quite up: then taking a live coal on his tongue, he put on it a raw oyster; the coal was blown on with bellows till it flamed and sparkled in his mouth, and so remained till the oyster gaped, and was quite broiled; then he melted pitch and wax with sulphur, which he drank down as it flamed; I saw it flaming in his mouth a good while; he also took up a thick piece of iron, such as laundresses use to put in their smoothing-boxes, when it was fiery hot, held it between his teeth, then in his hand, and threw it about like a stone; then he stood on a small pot, and bending his body, took a glowing iron with his mouth from between his feet, without touching the pot or ground with his hands; with divers other prodigious feats.' About 1818, Signora Josephine Girardelli, who described herself as the 'original Salamander,' performed astonishing feats of this kind in London and other places in England. According to the accounts of her, 'She commences her performances by passing plates of red-hot iron over her legs; she then stands with her feet naked on a plate of red-hot iron, and afterwards draws the same plate over her hair and across her tongue,' etc. About the same time appeared in Paris M. Chaubert, whose astonishing powers of resisting heat attracted the attention of the National Institute. Among other things performed by this person, was his going into a common baker's oven, with a leg of mutton in his hands, and remaining with the oven closed until the mutton was completely dressed. Another of his performances was standing in a flaming tar-barrel until the whole of it was consumed around him. He subsequently exhibited in London.

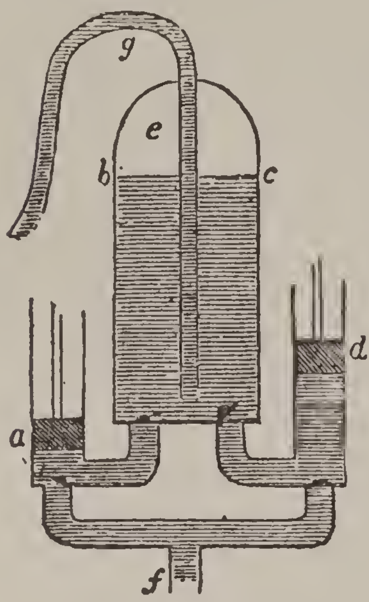
Many of the feats of this kind are undoubtedly mere tricks, or illusions, produced by sleight of hand; others are capable of scientific explanation. There is nothing more wonderful in stuffing blazing tow into the mouth—a common form of mountebank fire-eating—than in eating flaming plum-pudding, or in dipping the finger into spirits and letting it burn like a candle. It is well known that the tongue, or the hand dipped in water, may be rubbed with impunity against a white-hot bar of iron; the layer of vapor developed between the hot metal and the skin prevents contact and produces coolness (see SPHEROIDAL CONDITION OF LIQUIDS). Such performances as those of M. Chaubert are explained by the well-known power of the living body to maintain its normal temperature, for a time, independently of the external temperature (see ANIMAL HEAT).

FIRE-ENGINE: machine for throwing a jet of water to extinguish fires. This name was applied formerly to the steam-engine. Machines for the extinguishing of fires have been used from a very early date. They were employed by the Romans, and are referred to by Pliny; but he gives no account of their construction. Apollodorus, architect to Emperor Trajan, speaks of leathern bags, with pipes attached, from which water was projected by squeezing the bags. Hero of Alexandria, in his Treatise on Pneumatics—written probably about B.C. 150—proposition 27—describes a machine which he calls 'the siphons used in conflagrations.' It consisted of two cylinders and pistons connected by a reciprocating beam, which raises and lowers the pistons alternately, and thus, with the aid of valves opening only toward the jet, projects the water from it, but not in a continuous stream, as the pressure ceases at each alternation of stroke.

The accompaning copy of Hero's diagram explains itself. Little or nothing is known as to the extent to which engines of this kind were practically used. We have accounts of 'instruments for fires,' and 'water syringes useful for fires,' in the building accounts of the city of Augsburg, 1518; and in 1657, Caspar Schott describes a fire-engine used in Nuremberg, which must have been almost identical in construction with that described by Hero. It had a water-cistern, was drawn by two horses, was worked by 28 men, and threw a jet of water, an inch in diameter, to a height of 80 ft. It was not until late in the 17th c. that the air-chamber and hose were added; the first being mentioned by Perrault 1684, and the hose and suction-pipe being invented by Van der Heide 1670. In England, hand-squirts were used till the close of the 16th c. They were of brass, and contained three or four quarts of water. Two men held the handles at the sides, while a third forced up the piston. The nozzle was dipped in a vessel of water after each discharge, then raised, and the water again forced out. So clumsy an apparatus could have been but of little service in the fearful conflagrations to which the old English wood-built towns were subject.



With the addition of the air-chamber and hose, and some improvement in the details of construction, the 'siphons' of Hero became the modern fire-engine. The principle of the action of the air-chamber, and of its connection with the pumps, etc., is shown by the aid of the annexed diagram, where *a* represents in section a piston ascending, *d* the other piston descending, *f* the pipe or hose communicating with the water-supply, *g* the hose that conveys the issuing stream to the fire, *bc* the level of the water in the air-chamber, *e* the space above filled with compressed air. The rising piston raises the water from *f* to fill its cylinder, the descending piston forces the water contained in its cylinder into the bottom of the air-chamber, and thereby compresses the air in *e*. The pistons rise and descend alternately. The compressed air reacts by its elasticity, and pressing upon the surface *bc*, forces the water through the hose *g*. In the space *e*, above *bc*, the whole of the air that formerly filled the chamber is supposed to be compressed. Assuming this to be one-third of its original bulk, its pressure will be about 45 lbs. to the square inch, and this pressure will be continuous and nearly steady, if the pumps act with sufficient force and rapidity to keep the water at that level. As air may be compressed to any extent—and its elasticity is increased in exactly the same proportion—the force that may be stored in the compressed air is limited only by the force put upon the pumps, and the strength of the apparatus.



Under proposition 9 of the same work, in which ‘the siphons used in conflagrations’ are described, Hero describes and figures the air-chamber as ‘a hollow globe or other vessel, into which if any liquid be poured, it will be forced aloft spontaneously and with much violence, so as to empty the vessel, though such upward motion is contrary to nature.’ The globe is represented with a single piston attached for compressing the air. Thus, about 1,800 years elapsed before proposition 9 and proposition 27 of this work were put together for so obvious and useful a purpose as the fire engine, though the book was known to the mathematicians of the period; and when the two were put together, it was probably done by a practical man, who had never heard of the name of Hero.

The more recently constructed fire-engines include contrivances for preventing the entrance of mud and gravel, and for ready access to the valves in case of their being out of order, while the cistern is dispensed with, a hose being carried directly to the water-supply. They are usually drawn by two or four horses, though smaller engines are made to be drawn by hand or by one horse. The hose in England is usually of leather, fastened by metal rivets, instead of the sewing formerly used. In the United States, cotton is woven into a tube by machinery constructed for the purpose. Two such tubes are fitted one within the other, and held together by a solution of India-rubber, which, on consolidating, forms a water-tight layer.

The fire-engines of the London Fire Brigade establishment have usually 6-inch barrels with 7-inch stroke, and throw about 70 gallons of water per minute. Their weight, with implements, firemen, and driver, is about 30 cwt. These are found more convenient for general purposes than larger engines, as they can be drawn at a gallop by two horses for a distance under six miles. Four horses are used for greater distances. When a large engine is required, two of these may be joined together, and throw 180 gallons per minute. The pumps are worked by levers, with long horizontal bars attached, to enable a number of men to work together upon the same pumps. Many larger engines than these have been constructed, and steam has been successfully applied. The first application of the steam fire-engine was made when the Argyle Rooms in London were burned 1830. Several floating fire-engines for conflagrations near the Thames have been constructed and worked by steam; one of these is capable of throwing 1,400 gallons per minute. The steam fire-engines have recently been greatly improved, and steam of more than 100 lbs. pressure on the square inch can be raised in seven minutes after making the fire: some of these engines throw a jet to a vertical height of abt. 200 ft., or can drive water horizontally through half a mile of pipe. In the United States all the larger-cities and towns have steam fire-engines, often of great capacity as to volume of water thrown, and great power as to distance. The engines are drawn by horses of superior breed, kept always ready harnessed, and perfectly trained. A stationary boiler in the engine, is often used to keep a supply of steam in the boiler of the fire-engine at a pressure of abt. 50 lbs. The engines now in use are of three kinds—rotary engines; engines having reciprocating pumps with fly-wheels; and the same without fly-wheels.

It has been questioned whether, in cases of very intense combustion, a comparatively small stream of water has any subduing effect at all—some assert that it may even increase the conflagration. Various chemical liquids have been proposed as flame-extinguishers; but plain water is still the only power used to any extent.

Fire-Brigades, or Fire-Departments.—For working hand fire-engines, a body of *firemen* are required. The London Fire-brigade was formed 1833. The establishment comprises about 550 firemen, 60 stations, 115 manual engines, and 40 steam engines (3 of them floating). The water-supply in London is not so well managed as the engine-supply, thereby frustrating the exertions of the firemen. At Paris, as on the European continent generally, the fire-engines and firemen are under government control; and the *sapeurs pompiers*, or firemen, are empowered to enforce the assistance of any people they can find in the streets.

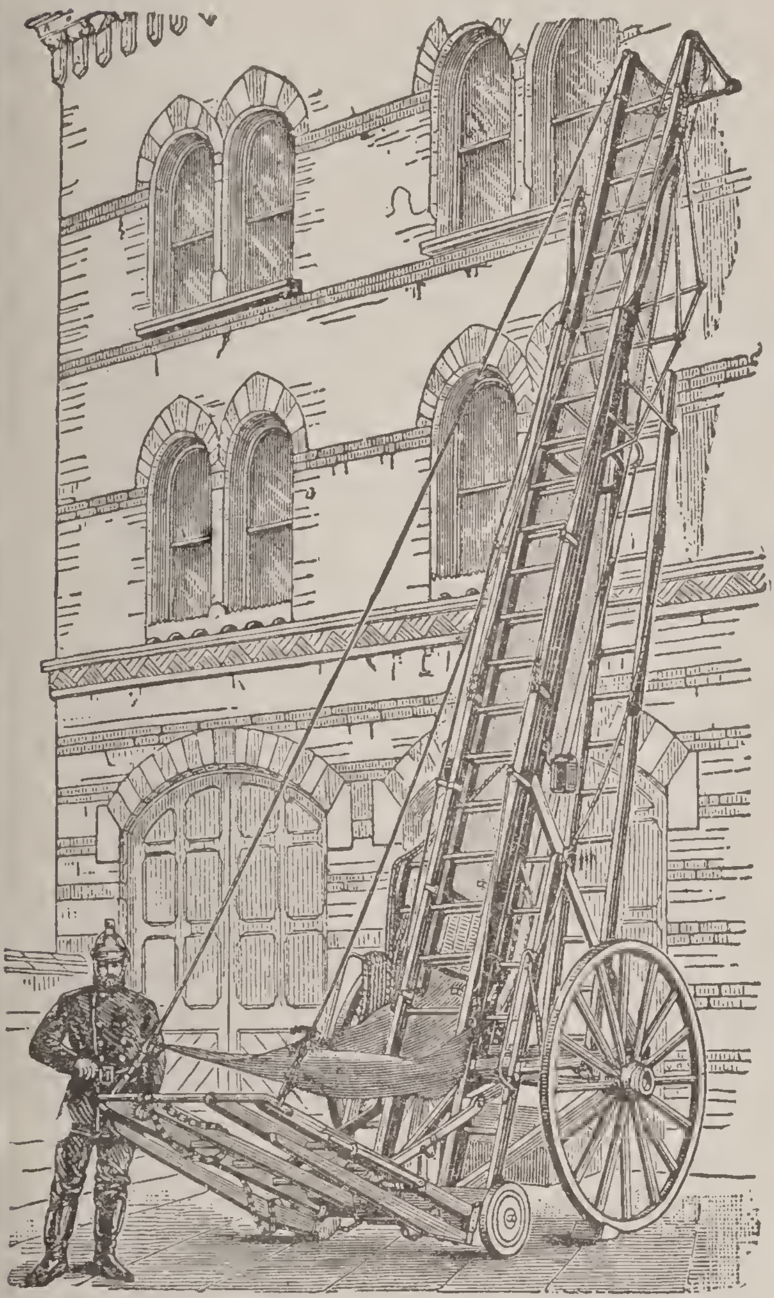
In many continental towns, fire-watchmen are stationed in commanding situations, such as church-towers; and their duty is to ring a fire-bell, or otherwise give the alarm, immediately upon observing a conflagration. In the United States, the fire-companies in some towns are composed of volunteer firemen, who receive no pay, but certain immunities from taxation and militia service. Their annual parade day is quite a fête. Each company has a special uniform; and in some cities there is much rivalry among them. In other towns, and increasingly in recent years, a paid fire-department is employed by the municipal authorities. Prizes are awarded to companies whose engines throw a jet of water to the greatest height. An admirable system of electro-telegraphy has been adopted, to give notice from station to station in the event of fire. Nevertheless, American conflagrations are often frightfully destructive, as in more recent years, at Chicago 1871, and at Boston 1872, 73.

In Constantinople, there are two fire-towers, one on each side of the Golden Horn, with watchmen continually stationed there. A large wicker-ball is hauled up to the side of the tower as a signal, and the cry of 'There is a fire at Scutari, Tophané,' or whatever be the quarter of the city in which it occurs, is raised and taken up by the patrol, who strike the pavement with their iron-bound staves as they repeat the cry. In a few minutes, the alarm is thus spread throughout the whole city.

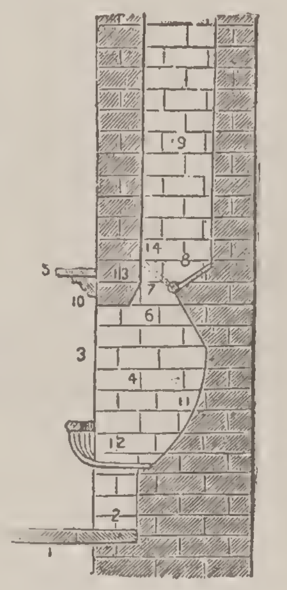
FIRE'-ESCAPES': apparatus for escape of persons from upper flats or floors of buildings when the lower are on fire. An immense number of contrivances have been proposed; of two distinct kinds—one for affording aid from outside, and the other for enabling those within to effect their own escape. Of the latter, the simplest is a stout cord or small rope, firmly attached to the window-sill of every sleeping-apartment, and coiled up within. A rope one-quarter or three-eighths of an inch thick, and knotted at intervals of about 12 inches, is well adapted for the purpose. A good quarter-inch sash-cord if new will support from three to four cwt. or more. A man with moderate 'nerve' may let himself down by such a cord, either by placing his feet against the wall and bringing 'hand over hand' down upon the knots, or by clinging with his feet and knees to the rope as well as with his hands. A man may let down a woman or child by means of a sack at the end of the rope, or simply by fastening them to the end, and letting the rope pass through his hands, aided if necessary by the friction of the window-sill, if it be allowed to bend over it. A rope coiled upon a drum inside a dressing table, with a winch-handle to uncoil it, is another form. A pulley fixed to the window-sill, over which runs a rope with a chair or simple board to sit on, is another.

In tall houses some means of escape from every sleeping-room should be provided, and the inmates should be thoroughly prepared by knowing beforehand how to act in case of a fire cutting off communication with the stairway. In a row of houses with projecting balconies, a board of sufficient length to reach from the balcony of one house to

PLATE 21.



Messrs. Shand, Mason & Co.'s London **Fire-escape.**



Section of **Fireplace:** 1, Slab; 2, Hearth; 3, Jamb; 4, Fireplace; 5, Mantelpiece; 6, Throat; 7, Gathering; 8, Funnel; 9, Flue; 10, Mantel; 11, Back; 12, Grate; 13, Breast; 14, Damper.

Common **Firefly** (*Pyrophorus noctilucus)* in burrow of mole-cricket, showing the two oval phosphorescent organs in the thorax.

the next may be kept in each room. An exit by the roof or from the window on to the parapet affords a ready means of escape from a top-story, and should always be provided in tall houses. In case of emergency, when no provision has been made, the bedclothes and curtains may be securely tied together to form a rope; or as a last resource, the bedding may be thrown out of window to form a cushion to alight upon in case of the cord or bedclothes being too short to reach the ground. If there be no time to extemporize such cordage, and it should be necessary to drop directly from the window down upon the mattrasses previously thrown down, it would be better to hang by the hands from the window-sill and then drop, than to jump direct. In all such cases, self-control is of the utmost importance.

Fire-escapes, to be used from without, consist either of simple ladders kept in some public buildings or other convenient stations, or a series of ladders that can be joined together; of poles with baskets attached; of ropes with weights at one end, that they may be thrown or shot into windows; of combinations of ladders, ropes, bags, baskets, nets, etc. The fire-escape now generally adopted in London by the Soc. for the Protection of Life from Fire is a light carriage or framework on wheels, to which a series of ladders, etc., are attached. It is thus described by the society: 'The main ladder reaches from 30 to 35 ft., and can instantly be applied to most second-floor windows by means of the carriage-lever.' This projects on the opposite side to the ladder like the shafts of an ordinary carriage, and works upon the axle of the wheels as a fulcrum. 'The upper ladder folds over the main ladder, and is raised into position by a rope attached to its lever-irons on either side of the main ladder; or, as recently adopted in one or two of the escapes, by an arrangement of pulleys in lieu of the lever-irons. The short ladder for the first-floors fits in under the carriage, and is of the greatest service. Under the whole length of the main ladder is a canvas trough or bagging made of stout sail-cloth protected by an outer trough of copper-wire net, leaving sufficient room between for the yielding of the canvas in a person's descent. The addition of the copper-wire is a great improvement, as, though not affording an entire protection against the canvas failing, it in most cases avails, and prevents the possibility of any one falling through. The soaking of the canvas in alum and other solutions is also attended to; but this, while preventing its flaming, cannot remove the risk of accident from the fire charring the canvas. The available height of these escapes is about 45 ft.; but some of them carry a short supplementary ladder, which can be readily fixed at the top, and which increases the length to 50 ft.' The society has more than 120 of these fire-escapes stationed in different parts of London. They stand in the roadway, and are each under the charge of a conductor during the night. Almost every house in London is within two or three minutes' run of one of these. Since 1836, when the operations of the society began, they have saved thousands of lives. At one fire, nine lives were saved by one man and fire-escape. When required, the apparatus is run to the burning house, the main ladder standing nearly upright all the while. It is then directed to the required window at a considerable inclination, and the attendant ascends the ladder, and helps the inmates either to descend by it, or if they are unable to do this, he lets them down by the canvas trough, which forms an inclined plane, along which they may easily and safely descend with the aid he is enabled to afford them.

FIRE EXTINGUISHER: apparatus to extinguish fires by pouring on or into them streams of carbonic acid, sulphurous-acid, and other gases which do not support combustion. There are various forms, and their value is chiefly in the earliest stage of a fire, or where air has not free access, i.e. in confined rooms or places in houses. A later invention is a sort of fire hand-grenade, a glass bottle, full of chemical fluid which, when released by the breaking of the bottle, emits dense volumes of gases that stifle the flames.

Firefly (*Lampyris Italica*).

FIRE'FLY: name common to all winged luminous insects, at least to all that possess much luminosity. Except the lantern fly (q.v.), they all are coleopterous, and belong to two nearly allied tribes, *Lampyrides*, to which the glowworm (q.v.) also belongs, and *Elaterides*, to which belong the skipjack beetles, and of which the larvæ are well-known to farmers as wireworms. The male glowworm, which alone is winged, has too little luminosity ever to receive the name of F. but the fireflies of the south of Europe (*Lampyris Italica*) and of Canada (*L. corusca*) are nearly allied to it: see GLOWWORM. Fireflies are seen only in the most southern parts of Europe. They abound in almost all the warmer parts of the world, and, in the warm summers in the United States and Canada, presenting a brilliant spectacle when glancing about in numbers amid the darkness of night. The light is yellow and is emitted more frequently while flying. Their flight is slow, and the light is given at regular intervals of two or three seconds. The insect is a little beetle, with soft elytra, of a light brown color, marked with red, and striped; the light proceeds from the last three segments of the abdomen, which are of delicate cream color by day. At night, these three segments are faintly bright at all times. If this part be plucked off and crushed, patches of brilliance appear for a few moments among the flesh, but they gradually die away. They often hover in hundreds over wet and marshy ground, or above a river, or a large field. Still more brilliant are the fireflies of tropical regions, belonging to the tribe *Elaterides*, as the F. of the W. Indies (*Elater noctilucus*), which gives out its light chiefly from two eye-like tubercles on the thorax. The light is so powerful, that small print may be read by it; and this becomes quite easy if a few of the insects are inclosed in a small glass vessel. They are frequently employed—particularly in San Domingo—to give light for household purposes; and they are used for purposes of decoration on festival days by women, who attach them to their dress or to their hair. One which had been accidently brought alive to Paris, once astonished and alarmed the Faubourg St. Antoine. These insects are caught in some parts of the W. Indies—a torch being used to attract them—and brought into houses to destroy mosquitoes, which they eagerly pursue and devour. See LUMINOSITY OF ORGANIC BEINGS.

Firefly
(*Elater noctilucus*).

FIRE ISLAND: strip of wave-made beach 40 m. long, averaging ½ m. wide, off Long Island, between Great South Bay and the Atlantic Ocean; belonging to Suffolk co., N. Y. The beach took its name from the fires built there as signals to vessels during the war with England 1812. Between the beach and the mainland, in Great South Bay, are five small islands; but there is now no F. I. proper. About 45 m. e. of the inlet to the bay the beach joins the mainland. The entire strip forms a popular and well-known watering place, readily reached from Babylon, L. I., extremely salubrious, and with air affording a positive specific for hay fever. There is a large hotel near the Babylon ferry, and within a few rods to the e. a light house 185 ft. high with a revolving light and 8 refractors of French ground glass that alone cost $17,000.

FIRELESS STEAM ENGINE: locomotive engine, driven by steam produced without a fire on the engine; is for many purposes a desideratum. For street cars especially is it desirable, and the use of electricity for their propulsion is an indicator of this need. By dispensing with a fire the weight of coal and the annoyance of ashes and the services of a stoker all are avoided. The F. S. E. simplest in principle was the invention of Dr. Emile Lamm of New Orleans. The apparatus included a boiler and ordinary steam engine. The boiler was first partly filled with water, and into this steam was injected at high pressure until the temperature rose to 360° or more, and until the pressure was about 150 lbs. to the sq. inch. It is clear that thus a large amount of steam would be converted into water, and at such a high temperature as to be ready for reconversion into steam by reduction of pressure. On opening the throttle-valve the steam would at once enter the cylinder of the engine, and would drive it until the pressure fell to nearly the atmospheric limit, the temperature of the water also decreasing. In this way the highly heated water was made to represent a storage reservoir of steam. In practical working it was found that small engines could run 5½ m. with one charge; recharging required about 2 minutes. The steam pressure ran from 60 to 155 lbs. When it fell to the first named figure the boiler was recharged. Street cars were arranged to be thus driven, a long cylindrical boiler being used. The invention has not been extensively applied. The Carrolton R. R. Co. of New Orleans had ten engines in operation for some time.—The *Soda Engine* of Mr. Honigmann involves the use of strong solution of caustic soda. The boiler contains a compartment, representing the furnace, which contains the soda. It is charged hot. By its sensible heat it soon produces steam, and the engine can be started. The exhaust steam instead of being allowed to escape is carried into the soda chamber. There it parts with its sensible and latent heat, and raises the temperature of the soda lye by combining chemically with it. The solution is so strong that it can thus absorb a large quantity of water and develop from the combination a great increase of temperature. Approximately the temperature attained is equal to that of the boiling point of the soda solution. For street car propulsion, for work in mines, and in submarine torpedo-boats, where economy of air is necessary, or where it is desirable not to contaminate the atmosphere, these engines find their uses.

FIRE'LOCK: name applied to the old musket, when introduced 1690, which produced fire by the concussion of flint and steel; distinguished from the *matchlock* previously in use, which had been fired by the insertion of a lighted match at the powder pan. Writers of the earlier part of the 18th c. called firelocks ' asnaphans; a word obviously corrupted from the Dutch *snaphaan,* and leading to the inference that they were brought to England by William III. and his Dutch auxiliaries. Their invention is, however, involved in obscurity. The weapon was superseded before 1830 by the percussion musket; which, in its turn, has now yielded to the rifle. (q.v.).

FIRENZUOLA, *fē-rĕn-zô-ō'lâ,* ANGELO: 1493—prob. 1542, 3, or 4; b. Florence: author. After studying law at Florence and Perugia, he went to Rome, anticipating a brilliant legal career, but shortly abandoned the eternal city, disappointed in hope and shattered in health. He seems finally to have enrolled himself among the monkish brotherhood of Vallombrosa, and to have gained influence, in spite of his extreme license of morals, and of writing. His chief works are a spirited paraphrase of the *Golden Ass of Apuleius*—considered by his countrymen to excel the original in nerve and beauty of language; *I Discorsi degli Animali*—containing political lessons as uttered by his animal orators; *I Ragionamenti,* in close imitation of the *Decameron* in impurity of sentiment, and classic purity of language; *Il Trattato della bellezza delle donne,* eulogium of woman. The best edition of his works is that of Florence (1763, 3 vols.).

FIRE-PROOF BUILD'INGS: structures able to resist fire. The problem of constructing buildings proof against all risk of conflagration, has not yet been solved; as the liability though greatly diminished is not entirely averted. Precautions against fire must not be neglected in even a 'fire-proof' building. The most destructive fire in London since 1666 was that at Cotton's Wharf, 1861, the warehouses of which were called 'fire-proof.' The great fury of this conflagration was due to the nature of the goods that were stored—especially saltpetre, which though itself incombustible, intensifies immensely the combustion of other substances.

The nearest approximation to fire-proof construction may be obtained as follows: the walls should be of stone or brick, and any ties, lintels, etc., required in the construction should be of iron. The staircases should be of iron or stone, and the floors or landings of tiles, concrete, or stone. Wherever wood is inevitably used, it should be prepared with silicate of soda (see FIRE-PROOFING). Instead of wooden joists to support the floors of each story, arched stone or brickwork should be used, and this should be put together with sufficient care to be independent of the mortar. The roof should be constructed in like manner, wooden rafters being excluded. The doors should be of iron, and the security would be much increased if the doors between any two apartments containing combustible materials were double, with a space between them equal to the thickness of the walls. Of course, it is not practicable to carry out all these precautions in a dwelling-house, but the danger from fire may be considerably diminished by attending to some of them. Wooden staircases especially are dangerous. The most important conditions for a warehouse are, that each apartment shall be separated from the next by stout walls of non-conducting materials, and especially that each shall be as nearly as possible air-tight; and whenever, from the nature of the goods, ventilation is required, it should be obtained by periodically opening the doors and windows. If this latter condition is fulfilled, any fire would extinguish itself, unless there be with the combustible goods some oxygen-giving substance, such as saltpetre, chlorate of potass, or other nitrates or chlorates.

At first sight, it seems that a warehouse built entirely of iron, would be effectually fire-proof, but this is far from being the case. In the first place, iron conducts heat more readily than any other material used in building; secondly, cast-iron is liable to crack and split when suddenly heated or cooled. Iron supports may, under some circumstances, be even more objectionable than wood, for if the water from a fire-engine were to play upon a heated cast-iron girder, it would probably give way immediately, while a stout wooden beam might be extinguished before being burned through. When buildings supported by iron girders are burning, they are far more dangerous to firemen than those with wood, as iron girders split and fall without visible notice. It is on this account that floors of arched masonry are recommended. In great fires, the heat is sufficient to fuse iron. In the great Chicago and Boston conflagrations, it was found that the solid granite-brick, and iron, disintegrated and crumbled in the intense heat, and were no hindrance to the progress of the flames.

Without going to the expense of making warehouses, and manufactories 'fire-proof,' certain precautions not of a costly nature might be adopted, for merely checking the conflagration until the arrival of fire-engines. Among these simple measures, are iron doors hinged on stone between different departments; a sufficient deafening not easily destructible between the ceiling of one story and the floor of that above; and stone stairs. For rendering timber difficult of combustion, see FIRE-PROOFING.—See also SAFES.

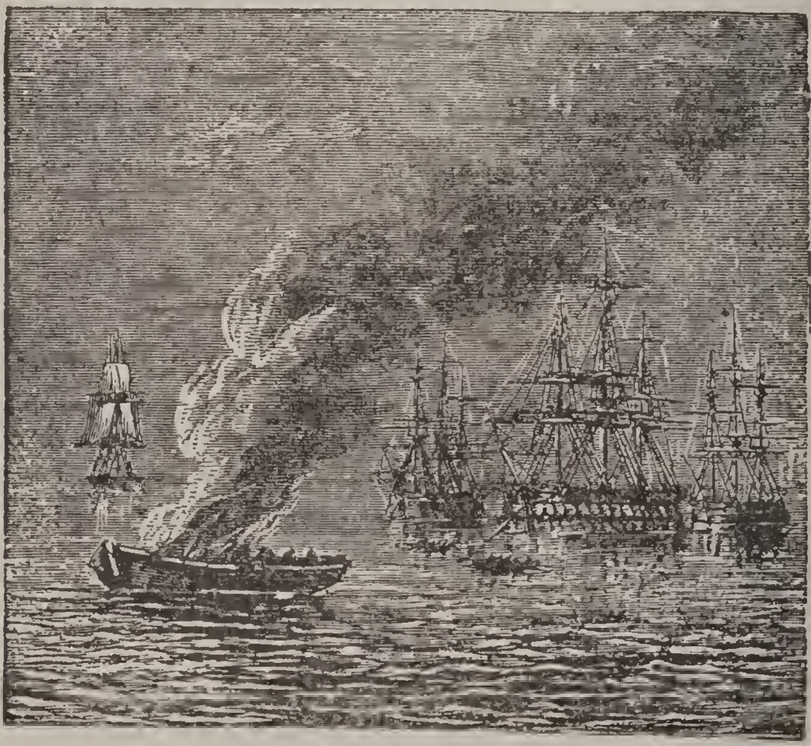
FIRE'-PROOFING: art of rendering substances incombustible. Attempts have continually been made to render cotton, linen, and other textile fabrics, timber, etc., incombustible; but thus far with only partial success. There are many means by which fabrics may be prevented from flaming, their combustion being reduced to a slow smouldering. By moistening the fabric with a solution of any saline substance, which, upon drying will leave minute crystals deposited in or between the fibres, its inflammability will be greatly diminished, but the salt imparts a degree of harshness to the fabric, and in many cases weakens the fibres. Alum, sulphate of zinc, and sulphate of soda have been used, and are effectual to prevent flaming, but they weaken the fibre. Common salt does the same. Phosphate and sulphate of ammonia are less objectionable on this account, but the former decomposes by contact with the hot iron in ironing. Tungstate of soda has been proposed, and is said to have no injurious effect on the fibre. Sulphate of ammonia, chloride of ammonium (sal ammoniac), and borax, are among the best fitted for domestic use, though not unobjectionable. For made-up clothing, borax is, perhaps, the best, as it is most effectual in its action, and least injurious to the appearance of the article, though it is stated to have some weakening effect on the fibre in case of a tearing strain. Wood has been treated with milk of lime, alum, sal ammoniac, sulphate of ammonia, chloride and sulphate of zinc, sulphuret of lime and baryta, etc., its *inflammability*, but not its *combustibility*, is thus destroyed. Like the fabrics, when similarly treated, wood smoulders slowly. The most efficient protection to wood is silicate of soda. If planks of moderate thickness be brushed three or four times over, on each side with a strong solution, they are rendered almost incombustible; they will burn only when very intensely heated. The silicate fuses and forms a glass which envelopes the surface and even the internal fibres if the wood be sufficiently saturated, and thus seals it from the oxygen of the air.

FIRE-PROOF SAFES: see SAFES.

FIRE'-RAISING, in the Law of Scotland: equivalent term for arson (q.v.). Attempting to set fire to houses, crops, etc., is a distinct crime from arson (q.v.), or the actual destruction of property by fire. The attempt to burn growing crops of grain, etc., is a felony. These offenses are also misdemeanors at common law. Inciting others to commit fire-raising is an indictable offense; and, in some old cases, persons have been punished for the mere threats to commit the offense, without being guilty of any overt act.

The *English* Act 9 and 10 Vict. c. 25, declares that whoever shall maliciously, by the explosion of gunpowder or other explosive substance, destroy or damage any dwelling-house in which there is any person at the time, is guilty of felony. Blowing up a building with intent to murder, and thereby endangering life, or casting upon any person any explosive or corrosive fluid whereby grievous bodily harm is occasioned him, and similar offenses, are declared to be felony. Attempting any of these offenses subjects the perpetrator to a minor punishment. The manufacturing or having in possession any explosive substance, or dangerous or noxious thing, or any machine or instrument, for the purpose of committing any of the above offenses, is a misdemeanor.

FIRE-SHIP: vessel, usually old, filled with combustibles, sent in among a hostile squadron, and there fired, in the hope of destroying some of the ships, or at least of producing great confusion. Livy mentions the use of fire-ships by the Rhodians, B.C. 190; but among the first occasions in modern times when they are known to have been employed, were by the Dutch in the Scheldt during the War of Independence in the Netherlands, and, shortly afterward, by the English, 1588, against the Spanish Armada. The Chinese tried them against the British fleet before Canton 1857, unsuccessfully. The service of nav-



Fire-ship.

igating one of these ships into the midst of an enemy, there firing it, and then attempting to escape, is always fraught with great risk of failure and disaster.

FIRISHTA, Mohammad Kasim Hindu Shah: Persian historian: b. toward the end of the 16th c. (1570?) at Astrabad, on the Caspian Sea; d. (probably) soon after 1612. At a very early age, he went with his father (Gholam Ali Hindu Shah) to India, and when 12 years old, was at Ahmednuggur, in the Deccan, sharing the instruction which his father gave to Prince Miran Hussein Nizam Shah. He afterward became capt. in the body-guard of Murteza Nizam Shah; and when this king was deposed by his own son, F.'s former fellow-student—who, in his own turn, was deposed and murdered in less than a twelvemonth afterward—F. went to Bijapore (1589), where Ibrahim Adil Shah II., the reigning monarch, received him with great honor. F. soon after his arrival, took part in an action against Jumal Khan, in which he was wounded and taken prisoner, but soon escaped. His great work is the *Tarikhi Firishta*, or History of the Mohammedan Power in India, which he finished 1609. 20 years were spent in its preparation, and the number of books used for, and partly embodied in it—special histories of certain periods and provinces—amounts, according to F. himself (Introduction), to 35; but 20 others are quoted in the work. It consists—besides a preamble or introduction on the Progress of Mohammedanism in India, and a final treatise on the geography and the climate of India—of 12 divisions, treating of the kings of Ghinzi and Lahore, Delhi, the Deccan, Guzerat, Malwah, Candeish, Bengal and Behar, Mooltan, Sinde, Cashmere, Malabar, and of the saints of India. Written with an impartiality, simplicity, and clearness rare in an Eastern work, this history has become a standard work on the subject, into which it was the first to enter at length. Single portions have been translated by Dow, Scott, Stewart, Anderson, etc.; but the whole work, edited first by J. Briggs (Bombay 1831, fol. 2 vols.), was also translated by him (London 1832, 8vo, 4 vols.). A fuller account of F.'s life and writings, by the same author, is in Transactions of the Asiatic Society, vol. II.

FIRKIN, n. *fėr'kĭn* [Dut. *vier*, four, and old Dut. *kin* for *ken*, little]: old measure of capacity containing nine gallons (old ale and beer measure). But previous to 1803 it had two values, being estimated at eight gallons in old ale measure, and at nine in old beer measure. The firkin is equivalent to $9\frac{1}{7}$ imperial gallons: see Gallon. The word is applied also to a small barrel or covered tub used for butter, etc.

FIRLOT, n. *fėr'lŏt* [AS. *feortha*, the fourth, *hlot*, a portion]: old Scotch dry measure, of which there were four in a Boll (q.v.). Though differing in value for different substances and places, its relation to the boll remained invariable: see Peck.

FIRM, a. *fėrm* [F. *ferme*—from L. *firmus*, steadfast, strong: It. *fermo*]: closely compressed; hard; solid; constant; steady; resolute: N. the name or title under which a company transacts business; a partnership (q.v.): V. in *OE.*, to confirm; to establish; to fix steadily. FIRM'LY, ad. *-lĭ.* FIRM'NESS, n. stability; steadfastness; constancy; hardness. FIRM'ITUDE, n. *-ĭ-tūd*, in *OE.*, the state of being firm; firmness; strength.—SYN. of 'firm, a.': fast; fixed; unshaken; compact; dense, stable; stanch; robust; strong; certain; steadfast.

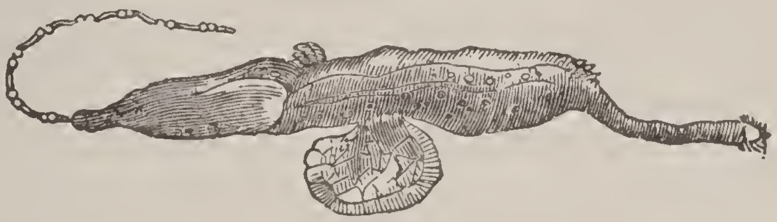
FIRMAMENT, n. *fėr'mă-mĕnt* [F. *firmament*—from L. *firmamen'tum*, a support, a prop—from *firmus*, firm: It. *firmamento*]: word in use of old to signify the seeming vault of heaven; the sky; an expanse or wide extent. FIR'MAMEN'TAL, a *-mĕn'tăl*, pertaining to the firmament.—The word *Firmament* found its way into English from the Vulgate, which renders the Septuagint *Stereoma* and the Hebrew *Rakia*, by the Latin *Firmamentum* (Gen. i. 6). Rakia (from the verb *raka*, to beat or strike out) signifies whatever is expanded or stretched out, and was specially employed by the Hebrews to denote the hemisphere above the earth, compared (Ex. xxiv. 10) to a splendid and pellucid sapphire. Elsewhere (Ez. i. 22–26) it is spoken of as the 'floor' on which the throne of the Most High is placed. Hence it follows that the notions of solidity and expansion were both contained in the Hebrew conception of the firmament. The blue etheral sky was regarded as a solid crystal sphere, to which the stars were fixed (compare the *cælo affixa sidera* of Pliny, ii. 39, and xviii. 57) and which was constantly revolving, carrying them with it. This sphere or firmament divided 'the waters which were under the firmament from the waters which were above the firmament;' and the theory of the phenomena of rain, etc., was that there were 'windows in heaven'—i.e., in the firmament, through which, when opened, the waters that were above the firmament descended. 'The same day were all the fountains of the great deep broken up, and the windows of heaven were opened,' Gen. vii. 11. The notion of Greeks, and other early nations, was essentially the same. In the progress of astronomical observations, it was found that many of the heavenly bodies had independent motions, inconsistent with the notion of their being fixed to one sphere or firmament. Then the crystalline spheres were indefinitely increased in number, each body that was clearly independent of the rest having a sphere assigned to it, till a complex system was introduced, capable of being fully understood only by the philosophers who formed it: see PTOLEMAIC SYSTEM. It was long before men formed the idea of the possibility of a body being maintained in motion in space without a fixed support, and considering the number of phenomena of which the hypothesis of a crystalline firmament offered an apparent explanation, we must regard it as having been in its day a curious and ingenious speculation.

FIRMAN, n. *fėr'măn* [Turk. *firmaun;* Pers. *farman*, a mandate, order]: word used by the Turks to denote any official decree emanating from the Ottoman Porte. The right of signing any F. relating to affairs connected with his special department is exercised by every minister and member of the divan, but the office of placing at the head of the F. the *thograï*—a cipher containing the name of the sultan in interlaced letters, and which alone gives effect to the decree—is committed to the hands of a special minister, who is called *nichandji-effendi*. The name applied to such decrees as have been signed by the sultan himself is *hatti-sherif*. The name F. may signify also a more formal kind of Turkish passport, granted only by the sultan or by a pasha.—A written permission to trade is called in India a firman.

FIRMINY, *fĕr-mē-nē':* town of France, dept. of Loire, six m. s.w. from St. Etienne, with which it is connected by a branch railway. Near it are rich coal-mines. It is a place of much activity, and has manufactures of silk, glass, and hardwares. Ribbons and nails are among the articles most largely produced. Much lamp-black also is made. Pop. (1881) 12,182; (1891) 14,502.

FIRN, n. *fĕrn* [Swiss]: name for the slightly compacted snow of the higher Alps. see Névé.

FIROLA, *fĭr'o-lâ:* genus of gasteropodous mollusks, of the order *Heteropoda*, entirely destitute of shell—though there is a small branchial shell in the nearly allied genus *Carinaria;* of a very elongated form, having the mouth at the extremity of a proboscis; tentacula wanting, or merely rudimentary; and generally remarkable for great transparency of substance, often enlivened with golden spots. They swim by means of the *foot*, which is compressed into a fin, are often seen at the surface of the water in calm weather, and are abundant in the warmer temperate and tropical seas. The oxygenation of the blood is supposed to take place in part through the delicate tissues, as there are no special breathing organs but a ciliated band.



Firola Frederici.

FIROZPUR: see Feroze Pore.

FIRST, a. *fĕrst* [Icel. *fyri*, before; *fyrstr*, in front of all: L. *primus*, first]: earliest in time; foremost; chief; principal; primary; the ordinal of *one:* Ad. before anything else. First'ling, n. the first-born of beasts; in *OE.*, a thing first thought of or done. First'ly, ad. *-lĭ*. First-rate, of highest excellence; of the greatest size, as a man-of-war. First floor, in the *United States*, the ground-floor; in *England*, that above the ground-floor. First-fruits, the earliest mature fruits or produce of the earth; the first profits; first or earliest effects or results, used in a good or bad sense. AT FIRST, at the beginning. FIRST-HAND, directly; immediately; new, as opposed to second-hand. FIRST INTENTION, the healing up of a cut or wound without suppuration. FIRST AND LAST, throughout; on an average. FIRST OR LAST, at one time or other. FIRST-FIT, n. *fĭt*, or FIRST FOOT [Scot. *fit*, foot, person]: in *Scot.*, the person who first enters a dwelling from without on the first day of the year.—SYN. of 'first, a.': original; primitive; primæval; pristine; highest; primordial; earliest.

FIRST-BORN [Heb. *Bekor*, Gr. *prototokos*, Lat. *primogenitus*]: in scriptural use, the first male offspring, whether of man or of animals. By a principle of the Mosaic law, indeed of the common law of nature, it was established that the firstlings of all the produce of creatures, whether animate or inanimate, were in some sense due to the Creator as a recognition of His supreme dominion: see FIRST-FRUITS. Under the title arising from this recognition are to be classed many observances regarding the F. B. of animate beings rational or irrational, which prevailed among eastern nations generally, or which are specially established by the Mosaic law.—1. The F. B. male, whether of men or of animals, was devoted from the time of birth to God. In the case of F. B. male children, the law required that, within one month after birth, they should be redeemed by an offering not exceeding in value five shekels of silver (Ex. xiii. 13). If the child died before the expiration of 30 days, the obligation of redemption ceased; but if that term were completed, the obligation was not extinguished by the subsequent death of the infant. This redemption took place according to a fixed ceremonial. The F. B. male of animals also, clean or unclean, was equally regarded as devoted to God. The F. B. of clean animals, if free from blemish, was to be delivered to the priests within 12 months after birth, to be sacrificed to the Lord (Deut. xv. 21); nor was it permitted to any but the priests to partake of the flesh of such victims (Num. xviii. 18). If the animal were blemished, it was not to be sacrificed, but to be eaten at home (Deut. xv. 22). The F. B. of unclean animals, not being a fit subject for sacrifice, was either to be put to death, or to be redeemed with the addition of one-fifth of its value (Lev. xxvii. 27; Num. xviii. 15). If not redeemed, it was to be sold, and the price given to the priests.—2. Primogeniture, both by the patriarchal and by the Mosaic law, had certain privileges attached to it, the chief of which were the headship of the family, and a double portion of the inheritance. Before the time of Moses, however, it was in the power of the father to decide which among all his sons should be considered the first-born. Moses ordained that the right should invariably belong to the F. B. in point of time.

Among other nations considerable variety existed as to the succession of children to the inheritance of their parent. The Greeks, especially the Athenians, excluded the females of a family so rigorously from the inheritance, that in the event of a father dying intestate and without heirs-male of his body, the nearest male kinsman succeeded to the estate. The later Romans, on the contrary, placed daughters on the same footing with sons as to the division of intestate property. The Mohammedans gave the daughters a certain share of the father's estate, but only one-half of that assigned to the sons. All the nations of Germanic descent restricted the succession, especially in land, to heirs-male. But the Visigoths in Spain admitted females, except in certain contingencies.

For the rights of the F. B. in English and Scotch law, see SUCCESSION: PRIMOGENITURE: ETC. In France, the law of primogeniture fell at the Revolution, in common with many other relics of the feudal system. How far the results of the change have been beneficial, is still a question among political economists. In Virginia, after the revolution, a similar change took place; and that the change has been in accordance with public opinion in that state may be inferred from the fact, that a parent now usually makes, by will, the same disposition of his property as that which would be provided by the law itself in the case of his dying intestate.

FIRST-FRUITS [Heb. *reshith*, Gr. *protogennemata* and *aparchai*, Lat. *primitiæ*]: that portion of the fruits of the earth and other natural produce, which, by the usage of the Jews and other ancient nations, was offered to God, as an acknowledgment of His supreme dominion and a thanksgiving for His bounty. Among the Jews, the institution of first-fruits comprised both public and private offerings. Of the former class, there were three principal offerings: the first was at the opening of the grain harvest. On the day after the Passover Sabbath, 16th of the month Nisan, a sheaf of new grain, cut and gathered with much solemnity, was carried to the Holy Place, and there waved before the altar (Lev. xxiii. 5, and foll.); nor was it permitted to commence the harvest-work till after this solemn acknowledgment of the gift of fruitfulness. Again, at the Feast of Pentecost, two loaves of leaven bread, made from the flour of the new harvest, were waved, with a similar form of worship, before the altar (Ex. xxxiv. 22). Thirdly, at the Feast of Tabernacles, in the 7th month, was held the great feast of the gathered-in harvest, the final acknowledgment of the bounty of God in the fruits of the year (xxiii. 16).—Besides these public offerings of first-fruits on the part of the entire people, individual Jews were bound to private offerings, each on his own behalf. 1: A cake of the first dough of the year was to be offered to the Lord (Num. xv. 21). 2. The 'first of all the fruits' were to be placed in a basket, and carried to the appointed place, were the basket was to be offered with a prescribed form of words, commemorative of the sojourn of Israel in Egypt, and of his deliverance by the strong hand (Deut. xxvi. 2 and foll.). All these offerings were divided into two classes—the first, called *Bicurim*, comprised the various kinds of raw produce, of which, though the law seems to contemplate all fruits, seven sorts only were considered by the Jewish doctors to fall under the obligation of first-fruit offering—viz., wheat, barley, grapes, figs, pomegranates, olives, and dates. The law lays down no rule as to the quantity of the first-fruit offering; and many questions regarding it have been raised by the commentators. It was customary for the offerers to make their oblations in companies of 24, and with a singularly striking and effective ceremonial.

The second class of first-fruit offerings, called *Terumoth*, comprised the produce of the year in the various forms in which it is prepared for human use, as wine, wool, bread, oil, date-honey, dried onions, and cucumbers.—Under the kings, and again after the captivity, much laxity crept into the observance of this practice, which Nehemiah labored to revive in its primitive exactness. Offerings analogous to the Jewish first-fruits became usual very early in the Christian Church, as is clear from a passage in Irenæus (*Adv. Hær.* b. iv. c. 17 and 34); but the extent to which the practice prevailed, and the amount and general character of the oblation, are uncertain. It appears to have been merged in the legal provision established by the emperors.

The mediæval ecclesiastical impost known under the name of *primitiæ*, or first-fruits, and sometimes of *annates* or *annalia*, was entirely different. By the word in its mediæval and modern sense is meant a tax imposed by the popes on persons presented directly by the pope to those benefices which, by the canonical rules, or in virtue of privileges claimed by them, fall within the papal patronage. Persons so presented were required to contribute to the Roman see the first-fruits (that is, the income of the first year) of their benefice. During the residence of the popes at Avignon, when the papal necessities compelled the use of every means for eking out a precarious revenue, the impost was sought to be extended to every benefice; and this claim was the subject of many contests, especially in Germany and in England, where the claim, so far as regarded direct papal presentation, had existed from the reign of King John. Henry VIII., by two successive statutes, withdrew the right of first-fruits from the pope, in order to transfer it to the king; and he established a special court for the administration of first-fruits, which, however, was soon disused. In the reign of Anne, the revenues arising from this impost in England were vested in a Board, to be applied for supplementing the incomes of small benefices. A similar change was introduced in Ireland by the 2 Geo. I. c. 15; but in the latter kingdom the payment was entirely abolished by the 3 and 4 Will. IV. c. 27. In France, this tax was abolished by the 'Pragmatic Sanction' enacted at Bourges 1438, and subsequently by the *Concordat* of Leo X. with Francis I., 1512. In Spain, it ceased partially in the reign of Ferdinand and Isabella, and finally under Charles V. In Germany, it formed one of the first among the *Centrum Gravamina* presented to the emperor 1521, and the claim ceased altogether from that period.

FIRTH, n. *fèrth*, often spelled FRITH, n. *frĭth* [Icel. *fjördr;* Dan. *fjord*, an arm of the sea; Gael. *frith*, small, little: L. *frĕtum*, a narrow sea]: the mouth of a river widening into an arm of the sea; any narrow passage of the sea; a strait. *Note.*—Skeat says FRITH is connected with L. *portus*, a haven, Gr. *porthmos*, a ferry, and not with L. *fretum*, and that the original sense was 'ferry.'

FISCAL, a. *fĭsk'ăl* [OF. *fiscal*—from OF. *fisque*, the public purse—from L. *fiscus*, a basket of rushes, a great money-bag: It. *fisco*]: pertaining to the public treasury or revenue: N. revenue; exchequer; in *Scot.*, a public officer who prosecutes in certain criminal cases, usually called the *procurator-fiscal*. FISCAL LANDS, lands, among the Franks, set apart for the use of the sovereign, to support his dignity, and to give him the means of rewarding merit or valor. FISCAL YEAR, the financial year of a government. In the United States, for all money accounts, appropriations, etc., the year begins July 1, and ends June 30 following; except that for the accounts of the sec. of the senate, for compensation and travelling expenses of senators, the fiscal year extends to and includes July 3.

FISCHART, *fish'ârt*, JOHN: b. prob. abt. 1545, either at Mainz or at Strasburg; d. prob. abt. 1590. Regarding his life little is known. He was by profession a jurist, but his writings show immense learning and reading in all departments of human knowledge. About 1570, he made a journey to England. Toward 1580, he was living at Strasburg in close friendship with the eminent book-printer, Bernhard Jobin. During 1581–2, he was advocate to the Imperial Chamber at Speier, and, 1585, became bailiff of Forbach, where probably he died. Of the very numerous writings which appeared 1570–90, partly under his own name, and partly under various fictitious names, about 50 have been proved to be on the whole genuine, though disfigured by interpolations. In respect to others, however, the authorship is doubtful. The original editions of almost all F.'s works are extremely rare, but new ones have recently been published. His most celebrated works are based on foreign models, particularly Rabelais, but there is no servile imitation: a free creative genius works plastically on the materials. To this class belong *Aller Praktik Grossmutter* (1573), *Affentheurlich Naupengehörliche Geschichtklitterung von U. S. W.* (1575), *Podagrammisch Trostbüchlein* (1577), *Binenkorb des Heyl. Römischen Imenschwarms* (1579), and *Der Heilig Brotkorb* (1580). These writings are wholly satirical. With the most inexhaustible humor, he lashes, now the corruptions of the clergy, now the astrological fancies, the dull pedantry, or other follies, public and private, of the time. Next to these stands the outrageously comic work of F.'s—quite original in its conception—entitled *Flöhatz, Weibertratz* (1574). Essentially different in its homely and simple tone is his *Das glückhafft Schiff von Zürich*, in verse, published 1576 (new ed. by Halling, 1829). Similar in point of style are *Psalmen und Geistliche Lieder* (1576; new edi. Berlin 1849). The rest of F.'s numerous writings, partly in prose, partly in verse, are of unequal merit, singularly varied in style and contents; the prose works being in general more complete than the poetic. What gives so high a value to F.'s satirical humor is the warm and genuine feeling which he exhibits for the moral foundations of all public and private life—viz., religion, 'fatherland,' and the family, a feeling which reveals itself in his wildest mirth. His works are, moreover, one of the richest sources whence to draw information with regard to the manners of his time. But perhaps the most extraordinary thing about F. is his treatment of the language. No German author can be compared with him, not even Jean Paul Richter himself. He coins new words and turns of expression, without any regard to analogy, but nevertheless shows the greatest fancy, wit, and erudition in his most arbitrary formations. The fullest collection of his writings is in the Royal Library at Berlin. For a critical account of the investigations concerning F. and his works, see Vilmar in Ersch and Gruber's *Encyclopædie* (s. 1, vol. 5).

FISETIN, n. *fĭz'ĕ-tĭn* : in *chem.*, the yellow coloring-matter of Fiset-wood (see FUSTIC), a species of sumach, *Rhus cotinus.* Fisetin crystallizes in needles which have the formula, $C_{15}H_{10}O_6$.

FISH, n. *fĭsh* [Goth. *fisks;* Icel. *fiskr;* Ger. *fisch;* Dut. *visch;* L. *piscis;* W. *pysg*, a fish]: an animal which inhabits the water, and breathes through gills; the flesh of a fish (see FISHES): a machine to hoist up the flukes of the anchor (but see FISH next below): V. to seek to catch fish; to be employed in catching fish; to seek to obtain by artifice; to search by raking; to draw out or up. FISH'ING, imp.: ADJ. used or employed in fishing (see below): N. the art or practice of catching fish. FISHED, pp. *fĭsht.* FISHY, a. *fĭsh'ĭ*, or FISH'LIKE, having the qualities of a fish. FISH'Y, a. in *familiar slang*, suspicious; rank; foul; not to be meddled with without due inquiry. FISH'INESS, n. state of being fishy. FISHMON'GER, n. *-mŭng'gėr*, one who deals in fish. FISH'ER, n. one who fishes. FISH'ERMAN, n. one whose occupation is to catch fish. FISHERMAN'S RING, seal ring used by the popes of Rome since the 13th c. as a stamp for certain documents—the seal giving the figure of apostle Peter fishing. FISHERY, n. *fĭsh'ėr-ĭ*, a fishing-ground; the trade of fishing (see below). FISHIFY, v. *fĭsh'ĭ-fī* [L. *făcĭō*, I make]: *familiarly*, to change or turn into fish. FISH'IFYING, imp. FISH'IFIED, pp. *-fīd.* FISH CULTURE: see PISCICULTURE. FISH-FAG, woman who sells fish; a fishwife. FISHWOMAN, or FISHWIFE, n. a woman who retails fish. FISH-PLATES, plates of iron which are bolted through to connect firmly the ends of the rails on the permanent way of a railway, so named from overlapping the rails like the scales of a fish (but see FISH next below). FISH-POND, a small inclosed piece of water for breeding fish (see PISCICULTURE). FISH-SPEAR, a spear for taking fish. FISH-TAIL, shaped like a fish's tail. FISHERMAN'S BEND, sailor's knot used in bending halyards to a studding-sail yard. NEITHER FISH NOR FLESH, neither one thing nor another.

FISH, n. *fĭsh* [F. *ficher*, to fix or drive in, as a nail; *fiche*, a gardener's dibble]: a counter or marker at cards; a piece of wood secured to another to strengthen it.—In *naval* *affairs*, THE FISH, apparatus of pulleys employed in dragging the flukes of the anchor toward the bow after it has been hoisted to the cat-head. FISH-FRONT, or PAUNCH, long piece of oak, or fir, convex without, concave within, securely fastened on the injured portion of a sprung mast or yard, to which it imparts rigidity. SIDE-FISHES are long pieces of timber dove-tailed on the opposite sides of a made mast, to give it a circular form and the requisite diameter. *Note.*—Perhaps *fish-plates* in preceding entry is connected with F. *ficher*.

FISH, **HAMILTON**, LL.D.: 1808, Aug. 3—1893, Sep. 7: statesman; son of Nicholas F. He graduated at Columbia College 1828, was admitted to the bar 1830, and entered political life as a whig 1834. He was a member of the state legislature 1837, in congress 1843–45, lieut.gov. of N. Y. 1847–49, gov. 1849–51, U. S. senator 1851–57, commissioner with Bp. Ames (Meth. Episc.) to visit Union soldiers in Confederate prisons (and negotiated a general exchange of prisoners) 1862, and U. S. sec. of state 1869, Mar.—1877, Mar. He united with the republican party on its formation, and while U. S. senator opposed the repeal of the Mo. Compromise. He was credited with having suggested the Joint High Commission for the settlement of difficulties between the United States and Great Britain growing out of the American civil war, and was one of the U. S. commissioners who negotiated the Treaty of Washington, 1871. He also settled the long-pending dispute with Great Britain concerning the n.w. boundary of the United States, and the complications with Spain over the *Virginius* outrages in Cuba. Gov. Fish was pres. of the N. Y. Hist. Soc., and pres. gen. of the Soc. of the Cincinnati.

FISH, **NICHOLAS**: 1758, Aug. 28—1833, June 20; b. New York: soldier. He entered the College of N. J. 1774, but soon left, and began studying law with Gen. John M. Scott. Early in 1776, he became aide-de-camp to Gen. Scott, and served through the revolutionary war, attaining the rank of lieut.-col. at its close, and taking part in the two battles at Saratoga, the battle at Monmouth, Sullivan's expedition against the Indians, and the operations at Yorktown. After the war he became adj-gen. of N. Y., supervisor of the U. S. revenue, and pres. of the N. Y. Soc. of the Cincinnati. He was an active promoter of several of the religious and benevolent institutions of the city and state.

FISHBURN, *fĭsh'bĕrn*, **WILLIAM**: 1760–1819, Nov. 3: soldier. He served on the staff of Gen. Anthony Wayne at the storming of Stony Point, became a maj.gen. in the revolutionary army, settled in S. C. after the war, was a member of the convention which framed the constitution of that state, served in the legislature, and died in Walterborough.

FISHER, **FORT**, Attacks on, and Capture of: 1864, Dec. 24, 25; 1865, Jan. 13-16. Fort F. was a strong earthwork with a land front 480 yds. long, and a sea front 1,300 yds long, erected on the peninsula between Cape Fear River and the Atlantic Ocean, to protect the harbor and city of Wilmington, N. C., the only remaining Confederate seaport of importance at the close of 1864. An expedition was organized for the capture of the stronghold early in Dec., the naval squadron being under command of Rear-Admiral Porter, and the troops of the land force under Gens. Butlar and Weitzel. The combined forces reached Federal Point, less than 2 m. s.w. of the fort, Dec. 15; and shortly after midnight on the 24th, a powder-ship containing 215 tons of powder was towed to within 200 yards of the shore and 1,000 yds. of the fort, and exploded. The experiment, on which great hopes of material injury to the fort had been based, proved wholly fruitless, and about noon the fleet opened fire on the fort, and silenced its guns in less than two hours. At daybreak, the 25th, Porter renewed the bombardment, and under its cover the troops landed, and approached to within 150 yds. of the fort, when Gens. Butler and Weitzel agreed that a successful assault with the force at their command was impossible. The troops were then withdrawn and sent back to the James river, while the fleet retained its position. Gen. Grant determined to renew the attack, and collected a new force of 8,000 men under Gen. Terry at Bermuda Hundred, 1865, Jan. 2, 3. Gen. Terry disembarked at Federal Point under cover of a heavy fire from the fleet, Jan. 13th, erected breastworks from the river to the sea; and, Porter having kept up his bombardment through the nights of the 13th and 14th, Terry landed and placed his artillery early on the 15th, and began the assault with soldiers and sailors at 3:25 P.M. At 4 o'clock one-half the fort had been carried, and at 9 the whole was occupied. The Confederate loss was 217 killed and wounded, 2,083 prisoners, 169 pieces of heavy artillery and many small arms, and the Union loss, 110 killed, 536 wounded. The assault and defense were conducted with great skill and stubbornness from beginning to end.

FISHER, *fís'hér*, George Park, D D., LL.D.: theologian: b. Wrentham, Mass., 1827, Aug. 10. He graduated at Brown Univ. 1847, and Andover Theol. Seminary 1851, after studying theol. in Yale Divinity School, 1848-9, continued his studies in Germany, 1852–54, and was appointed prof. of divinity in Yale Univ. and ordained pastor of the Yale University Church, 1854, Oct. He held this office of prof. till 1861, when he was transferred to the chair of ecclesiastical history. Beside contributions to the *New Englander*, of which he became an editor 1866, *North American Review*, *British Quarterly*, *Bibliotheca Sacra*, and *Princeton Review*, he has published *Essay on the Supernatural Origin of Christianity* (1865, 77); *Life of Benjamin Silliman*, 2 vols. (1866, 77); *The Reformation* (1873); *The Beginnings of Christianity* (1877); *Faith and Rationalism* (1879); *Discussions in History and Theology* (1880); *The Christian Religion* (1882); *Grounds of Theistic and Christian Belief* (1883); and *Outlines of Universal History* (1885) He received the degree D.D. from Brown Univ. 1866, and Edinburgh Univ. 1886, and LL.D. from the College of N. J

1879. His writings are characterized by profound learning, cogent thought, a broad Christian spirit, and a lucid and attractive style.

FISHER, *fĭshėr*, JOHN, Bishop of Rochester: 1459 (or 61, or 65)—1535, June 22; b. Beverley, in Yorkshire, England. He was educated at Michael House College (now incorporated with Trinity College), Cambridge, where he took his degree 1491, and of which he became master 1495. Margaret, Countess of Richmond, mother of Henry VII., charmed by the report of his virtues and learning, next appointed him her chaplain and confessor. In 1501, he was elected chancellor of the univ.; and in 1502, became the first Margaret prof. of divinity. Two years later, he obtained the bishopric of Rochester. For many years after this appointment, he labored diligently for the welfare of the church and the universities. The Reformation of Luther found in him—as might have been expected from his devout ecclesiasticism—a strenuous, if not an able opponent. In 1527, a rupture took place between him and Henry VIII., in regard to the divorce of Queen Catharine. F. refused to declare the marriage unlawful. From this period, he figures in the politico-religious strifes of his time as a stanch adherent of the papacy, and the leading opponent of the king's innovations. He opposed the suppression of the lesser monasteries 1529, and the acknowledgement of Henry as head of the church 1531, and thereby excited the dislike of the party of progress in the English nation. His credulity—many would apply a harsher term—in reference to Elizabeth Barton (q.v.), the 'Holy Maid of Kent,' involved him in a still more perilous antagonism to the king. He was imprisoned; and on refusing to take the oath affirming the legality of Henry's marriage with Anne Boleyn, he was committed to the Tower, 1534, Apr. 26, where he was treated with great barbarity. A kind but inconsiderate act of Pope Paul III. now hastened the destruction of the old man. His Holiness, as a reward of his faithfulness, sent him a cardinal's hat, 1535, May. When Henry was informed of this, he exclaimed: 'Mother of God, he shall wear it on his shoulders, then; for I will leave him never a head to set it on.' His ruin was now certain. He was accused of high treason, and after a brief trial, was condemned, and sentence of death was executed. F. was one of those unfortunate persons who, with abundance of personal virtues, find themselves opposed to the overwhelming tendencies of the times in which they live.

FISH'ER'S ISL'AND: in Long Island Sound, 9 m. off New London, Conn., but a part of the town of Southold, Suffolk co., N. Y. It is 7–8 m. long, 1–1½ m. broad, area 4,000 acres. It is a summer resort, noted for the variety of fish that abound in its vicinity, its lobsters, and its clambakes. It has a large hotel and numerous summer cottages, and a variable population.

FISHERY: capture of various kinds of fish for the purpose of trade. In many countries, and especially in the United States, Great Britain, and Ireland this pursuit affords remunerative employment to a large proportion of the population, and forms an unequalled nursery for sailors to recruit the navy.

In remote ages, fish were caught in the rudest manner by men who lay on the rocks, ready to shoot them with arrows, or transfix them with spears. Even yet, in regions only partly civilized, fish are taken with blankets or sheepskins; and a roughly made spear, known as a leister, is still used in the country districts of Britain in the illegal capture of salmon. Advancing intelligence, however, and the use of fish as an article of barter for other kinds of food, soon led to more effective modes of capture. Dwellers on the sea-coast began to exchange fish for animal food killed by inland hunters, and in this way initiated a commerce now represented by vast capital and enterprise. The importance of fisheries, as bearing on the food-supplies of nations, inland as well as maritime. and as a remunerative outlet for labor, can scarcely be overestimated, especially as fish has been in use for human food from the most remote periods. Previous to the Reformation, it was in universal demand in Britain, being the prescribed diet during the fasts appointed by the church. One great peculiarity of this source of wealth is that, with slight exceptions, the sea-harvest (if we may so call it) is ripened without trouble or expense for the fisher, who requires only to provide the means of gathering it; and that, under certain regulations, it is free to all comers. River fisheries, except for salmon, are unproductive in Great Britain; and Lochlevan is the only British fresh-water lake the produce of which is marketable.

The principal fisheries of Great Britain include the capture of salmon, herring, cod, soles, turbot, mackerel, lobsters, oysters, etc. Immense quantities of these are in constant demand: the various lines of railway that branch inland from the coast afford rapid transit, and have in consequence considerably enhanced the value of sea-produce, much of which was at one time useless for want of sufficiently rapid conveyance to those seats of population where it would have found ready sale. It is affirmed, indeed, by those who have studied the subject, that increased demands have affected the fisheries and rendered them less productive than formerly. The machinery of capture is being extended every year, and the supplies have now to be brought from greater distances, the shoals frequenting the coast lines being much exhausted by the incessant inroads made upon them by fishermen. It is difficult to obtain reliable statistics of the different British fisheries. Excepting the govt. board for Scotland, there is no recognized authority on the subject. The following figures, bearing on the herring-fisheries of Scotland, the most important fisheries of the United Kingdom, are taken from official returns by the commissioners, annually laid before parliament. They represent only the quantity of herrings which is 'cured,' but immense numbers of that fish are sold fresh, as taken from the sea. The herring fishery of 1880 was by far the largest ever known on the coasts of Scotland. In that year 1,473,600 barrels were cured (in 1875, 942,980). If each barrel contained 700 herrings, the number cured in 1880 would be 660,086,000. It would be no exaggeration to say that an equal number would be sold *fresh*. A large number of the barrels were branded by the government inspectors, £11,488 being paid in brand fees. The number of boats engaged in the Scotch fisheries (1880) was 14,751; fishermen and boys employed 47,131; estimated value of the boats and nets employed in the fisheries was £1,288,508. The Scottish cured herrings are sold not only in Great Britain, but in her colonies and foreign countries. At Hamburg and other continental seaports, there are merchants who deal largely in cured herrings, and employ agents who annually visit the various British ports to purchase supplies. It is for the satisfaction of these foreign buyers that the 'brand' is used; it denotes the quality of the herrings, and prevents one class of herrings being sold for another class that may be inferior. The principal seats of the herring-fishery in Great Britain are at Wick, in Caithness-shire, Scotland, and at Yarmouth, in England; but the industry is carried on at many other places on the British sea-board and on the coast of Ireland, which is 2,500 miles in extent. Unfortunately, the Irish sea-fisheries are declining. In 1846, there were 20,000 boats and 100,000 men and boys engaged; in 1879, there were only 5,834 boats, and 21,269 men and boys. At nine stations (1879) £139,880 were realized for herrings.

A visit to Billingsgate, the great fish-market of London, gives some idea of the food-wealth of the sea, many tons of all kinds of fish being daily distributed from that mart. The average quantities of white fish estimated to pass through Billingsgate in a year are as follows: Haddocks, 3,500,000; whitings, 20,000,000; soles, 100,000,000; cod, 950,000; plaice, 35,500,000; mackerel, 35,000,000. This estimate is only at the best a very rough one, as there are no arrangements for gathering such statistics. So great is the demand for white fish throughout the kingdom, that many fishermen sail north to the Orkney Islands to obtain them. Most of the cod-smacks carry their cargo alive as far as Gravesend; but they dare not venture farther up the Thames, as the fish would not live in its foul waters. The Irish seas are famed for the fine quality of their white fish; the haddocks of Dublin, in particular, have great reputation, but during late years they have become very scarce. In Scotland, a vast proportion of the haddocks are slightly smoked, and sold as 'Finnans,' a well-known breakfast delicacy. Large quantities of cod and ling are caught, split up, and sold in a dried state. In 1880 the cod, ling, and hake fishery produced 155,745¼ cwt. cured in that way, in addition to 7,794½ barrels which were pickled. In 1875 the yield was 187,788½ cwt. cured dried, and 11,749½ barrels pickled. The number of fish taken was 5,791,387, being 1,250,298 more than in the previous year. The most valuable white fish, individually considered, is the aldermanic turbot, which brings a high price. The supply of turbot is derived chiefly from Holland, the fishermen of that country making the capture of the turbot and the sole a *spécialité*. Eels also are caught in large quantities at all seasons, and fetch a remunerative price in the London fish-markets. As many as 16,285 boxes of eels are annually sent from Ireland to England. These boxes each contain on an average 40 lb. weight, and the price at 6d. per lb. would give in £ sterling a value equal to the number of boxes. In Scotland, where a prejudice has long existed against eels, the eel fisheries are beginning to prove remunerative.

The lobster, being by far the most valuable of the crustacean kind, is most assiduously nursed in ponds, so as always to be ready for market. Near Southampton, a thousand or two are kept always on hand, and steam-vessels are employed to bring them alive from the most distant parts of the coast: these boats are built exclusively for this purpose, and have immense wells in them to hold the living freight. The lobsters are not at once brought to London, but are kept ready in perforated boxes, in various parts of the Thames, to answer the demand as it arises. Norway supplies at least two-thirds of the lobsters used in Britain, the daily comsunption being estimated at 60,000. The lobsters taken from the British seas have to be sought at greater distances from the shore than formerly—those obtained on the immediate coast being now very small, technically called 'half lobsters.' There is an enormous demand for oysters, also and a considerable proportion of the maritime population earn a comfortable livelihood by breeding and dredging them. At Whitstable, Kent, and at various places in Essex, there are dépôts for sorting and storing oysters. The 'spat' is procured and grown in the course of four years into a marketable commodity of much value, the wholesale prices for the various kinds having been doubled between 1860–73. The oyster used to be found in great abundance on the British coasts, but some of the natural beds have been so largely drawn upon that they are becoming exhausted. The natural oysters of Ireland are now very nearly dredged up. In America, the oyster is a common mollusk, and notwithstanding a constantly increasing demand, the natural beds are still productive. See OYSTER.

While sea-fisheries are open to all who have the means of working them, salmon-rivers are for the most part private property. The owners of particular streams usually form themselves into an association chiefly for the protection of the fish during the spawning season. The usual method is for the 'lairds' to let their fishings to tenants, who are called 'tacksmen,' and whose interest it is to capture and sell all the fish they can find. The rents obtained are, in some instances, very large. Before the invention of packing in ice, and the introduction of steamboats and railways, salmon was hawked through the country towns by cadgers at an almost nominal price, while it was sometimes sold in the public markets at twopence per pound. When the increased demand, created by these facilities of conveyance, caused it to attain its present price, tacksmen were tempted to overfish their streams, and the consequence was the comparative exhaustion of particular rivers; but by protective acts of parliament, the salmon-fisheries are now proving very remunerative both to lessees and lairds, the fish having again become comparatively plentiful and of larger size. The rental of the river Tay, 1876–7, was £20,381. To pay such a rent, over 100,000 salmon and grilse, of the average weight of 10 lbs. each, would require to be captured: See SALMON: PISCICULTURE. The annual value of the salmon fishings for 1877 in England was £100,000, in Ireland £400,000, in Scotland £250,000. Recently a large import trade has sprung up in fresh, canned, and preserved salmon from British Columbia, Oregon, and New Brunswick. Below are the numbers of boxes of fresh salmon (each box 172 lbs.) received in London in 1880:

Scotch	17,408
Irish	9,666
English	1,993
From Berwick-on-Tweed	1,207
Dutch	568
Norwegian	400
Swedish	126
Canadian	103
Total for 1880	31,471

It is impossible, from the paucity of reliable information, to do more than roughly estimate the amount of capital employed in the British fisheries, or the value of the stock of boats, nets, and other instruments of capture. However, it is certain that the value of the annual produce of British fisheries of all kinds is not less than £6,000,000.

A semi-official estimate has been very carefully compiled of the supposed total annual value of the fisheries of Scotland (exclusive of salmon), with the following result:

Herrings	£960,485
Sprats	7,022
Cod and Ling	206,201
Haddock and Whiting	264,595
Turbot and other flat fish	12,280
Oysters	14,100
Lobsters, etc	32,269
Mussels and Whelks	8,479
Total	£1,505,431

Assuming that as many salmon are eaten in Scotland as are sent to London, that would add 46,056 boxes of 112 lbs. each; and taking the average price as five pounds per box, the sum, added to the above, would be £230,280, making a grand total of £1,735,711.

Figures giving the comparative values of the fisheries of various nations must be regarded as only approximate; but authorities quoted in *Nature* for 1881 estimate the total annual value of British fisheries at $31,500,000; American; $27,500,000; French, $16,250,000; Norwegian, $13,000,000; Canadian, 11,250,000. International fishery exhibitions have been held at Berlin (1880), Norwich (1881), Edinburgh (1882), and London (1883), illustrating methods and apparatus for the breeding, capture, preparation, and preserving of sea and river fish, models of boats and their tackle being included.

The food-fisheries of France have recently become very extensive, especially in the capture of sea-fish and crustaceans. A very large number of sardines are annually caught and cured in the French seas, the cure of this little fish being a very remunerative industry at Concarneau and other places. In the cultivation of those less important fishes which thrive best in lakes, canals, and rivers, the French excel, for while in other countries these are cultivated only for amusement (see ANGLING), the French people make them an article of commerce, and derive considerable money from their sale. At one time, the whole fresh-water fisheries belonging to France were not of so much value as one of the Scottish salmon streams; but by artificial cultivation and careful nursing, they have been much increased in value, and, by the care of the government, are being yearly improved. The fresh-water fisheries of France are of great extent, some of the fishponds in that country covering more than 30,000 acres. These fisheries all are more or less under control of the government. In Paris, the annual consumption of fish has been estimated to give for each individual 30 lbs. of sea-fish, and 1 lb. of fresh-water fish.

Among other national fisheries most worthy of notice are the river-fisheries of Germany, where there is assiduous culture of the Danube salmon and other fresh-water fish. In the Mediterranean, various kinds of fish are taken, the one of greatest value being the tunny. The anchovy and sardine also are taken in large quantities. For an account of the great eel-fishery at the mouth of the Po, on the Adriatic, see COMACCHIO. The Dutch are at present as industrious upon the sea as they were at the time when they founded Amsterdam, and a large proportion of the population of Holland are engaged in fisheries, which are still a source of wealth. The herring, though not taken by the Dutch in such large quantities as formerly, is as carefully cured as ever. Dutch-cured herrings having a great reputation. Excellent salmon are taken in the mouths of the Rhine, and many are sent to London for sale, as they can be supplied when British salmon cannot. The Norwegian fisheries afford large quantities of lobsters and turbots, while from Newfoundland is derived a plentiful supply of cod or ling. The Newfoundland fisheries, principally for cod, have existed for more than three centuries. Sir Francis Drake was the first person who fished there on behalf of England, and the fish he sent home soon excited a spirit of enterprise in the country, which led to the dispatch of a large number of ships and the extension of the fishery. The island is surrounded by the cod-banks, and the capture and cure of this fish are the staple occupation of the people. In America, immense quantities of shad are bred artificially to aid the natural supplies; the 'pisciculture' of salmon has also been commenced on a large scale, that fish having become scarce near the seats of great population. See NEWFOUNDLAND.

The oil-fisheries are not so important as they were, the invention of gas and the discovery of other lubricants having provided substitutes for whale oil. The success also of the whale-fisheries has fluctuated so much as to prevent modern capitalists from embarking very largely in the trade. The only novelties that distinguish the whale-fishery of the present day are the introduction of steam-whalers, and, in some instances, of vessels wintering in Greenland; but, with all these advantages, British whalers barely pay their expenses, and the fishery as compared with former years, shows considerable falling off. The total British whaling fleet numbered at one time 159 ships, but to-day it barely amounts to a tenth of that number. The seal is now largely captured for its oil, many thousands being annually killed by British sealers—as many as 15,000 being taken by the men of a single ship. See WHALE: CACHOLOT: SEAL: GREENLAND: ETC. The South-Sea or sperm-whale fishery is principally in the hands of the Americans, who pursue it most successfully.

The British and Irish sea and salmon fisheries are, so far, regulated by numerous acts of parliament protecting and promoting them. The sea-fisheries are, in effect, free to all who choose to fish; but the salmon is, by use and wont, as also by acts of parliament at various times, private property, though the owners of fisheries have had to submit them, from time to time, to the regulating power of the legislature.

By a treaty 1839 between Great Britain and France, the limits within which the general right of fishing in the intervening seas is exclusively reserved to the subjects of the two kingdoms respectively, are fixed at three miles' distance from low-water mark. In 1854, a similar treaty was concluded regulating, *inter alia*, the common rights of fishery between the British colonies in N. America and the United States. The Halifax Fisheries Commission constituted under the treaty of Washington (1871) gave 1877 an award of 5,500,000 dollars to Canada for conceding to Americans the right of fishing in Canadian waters. Fresh fish of British taking, imported in British bottoms, may be landed without report or entry. Persons employed in the fisheries, in such manner and under such circumstances as are laid down in 50 Geo. III. c. 108, are exempted from impressment.

It would be well if the various acts of parliament regulating the fisheries were codified or arranged in some logical sequence; and the various fishery offices might be consolidated under one governing board, instead of being as at present, scattered over various public departments, or administered in separate offices.

FISHERIES OF THE UNITED STATES. According to recent statistics, these employ 163,348 persons; of whom 26,683 are occupied on land and the remainder on the water, with 7,257 vessels of 174,020 tonnage, and 80,261 boats. The capital invested was $43,602,123; of which $11,133,265 was invested in vessels, $4,826,150 in boats, $8,363,462 in minor apparatus and outfits, nearly $19,300,000 in shore and other property. Value of products exceeded $44,277,514, of which the 'general fisheries' had $26,747,440, the oyster fishery $13,294,330, the whale $1,697,875, and the seal $438,228. The industry was classified under four heads, Ocean, Coast, River and Lake, and Strand and Shore. The Ocean Fisheries include: cod, at the Grand Bank, George's Bank, and Alaska, producing $4,000,000; whale as above (see WHALE); menhaden $2,117,000; mackarel $1,501,000; herring and sardines $1,130,000; halibut $447,000; winter haddock $295,000; antarctic seal and sea-elephants $112,000; hake and cusk $90,000; red snapper and groups $48,000; and swordfish $28.000. Of the Coast-Fisheries oysters furnish far the most important item; the others are: lobsters $732,000; the New England pound and trap fishery, the Middle States shore fishery, and that of sea-otters, each $600,000; the California shore fishery, $370,000; crabs, $328,000; mullet, $225,000; prawn and shrimp, $209,000; sponges $201,000; eels $190,000; the s. Atlantic shore fishery, $85,000; and that of scallops, $50,000. The River and Lake Fisheries (see PISCICULTURE) include: western salmon $3,300,000; shad and alewife $1,500,000; inland lake and creek fishery $1,500,000; on the great lakes: whitefish $900,000; general $600,000; sturgeon $237,000; smelt $48,000; eastern salmon $22,000. Strand fisheries and shore industries embrace: Alaska seal $1,541,000; clam or quahaug $1,014,000; round long clam $330,523; clam or quahaug $651,747; marine salt $306,000; abalone $128,000: turtle and terrapin $45,000; seaweed, $19,000; and Irish moss $16.000.

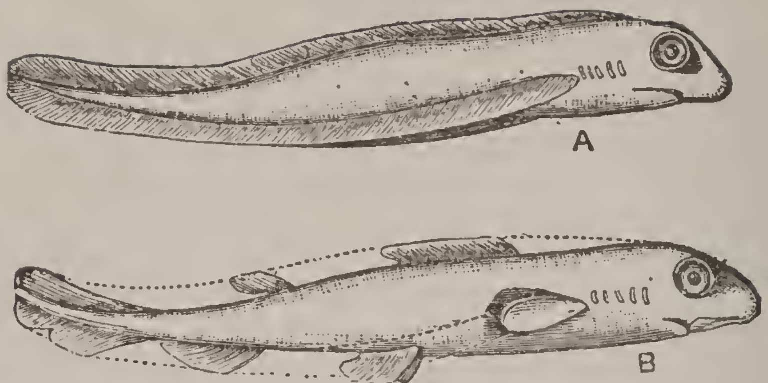
According to the report of the U. S. Commission of Fish and Fisheries there were in 1902, about 200,000 persons employed in the commercial fisheries of the U. S. The amount of capital invested was about $60,000,000, and the value of the products to the fisherman was approximately $50,000,000. The different regions in which fisheries exist are the New England, Middle Atlantic, and South Atlantic states on the Atlantic coast, the Gulf states on the Gulf of Mexico, the Pacific coast states, Alaska, the Great Lakes, and the various rivers and minor lakes.

During 1902 the propagation of food fishes was greatly favored by the conditions governing the collection of eggs, and also by increased appropriations. In consequence of these advantages there was an increased output of nearly all the species handled, and in the aggregate there were distributed 1,495,500,000 fish and eggs more than in 1901. Of these 99 per cent. were in the interests of the commercial fisheries, and 1 per cent. or 14,900,000 were game fishes. In the prosecution of its work the commission had 38 stations, situated in different parts of the country, several fish-distributing cars, and several vessels. The largest and best equipped of these stations is that at Woods Hole, Mass. Here in 1901 four vessels were constantly employed and two temporarily. In February arrangements were made to collect the eggs of flat-fish and 553 females were secured, of which 105 died and 123 failed to deposit eggs. The product of the egg-bearing fish amounted to 194,059,000 eggs, more than 700,000 per fish. In April egg-bearing lobsters were collected, and during the season the total number of eggs obtained reached 20,480,000, a slight increase over the previous year. The most important work, however, was that of the collection of brood cod. The total number of cod eggs obtained at Woods Hole, during the latter part of 1901 and the early part of 1902 amounted to 205,683,000, from which 128,810,000 fry were hatched and planted.

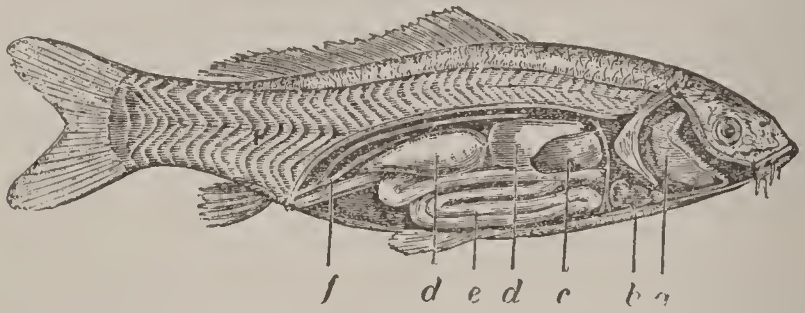
FISHERY-TREATIES OF THE UNITED STATES: international arrangements relative to fishery. By international law the sea for a league from shore belongs to the adjacent land, and without rights expressly conceded citizens or subjects of another power can neither fish there, nor dry and cure their fish on the land. The importance of the fishery interests along the coast of the United States and the British provinces, and the large numbers of the population of each engaged in fishing in those waters, have occasioned frequent collisions and mutual embarrassments, which could be allayed only by treaty between the two countries. That of 1783, which recognized the independence of the late colonies, allowed their citizens to fish on the Bank of Newfoundland, in the Gulf of St. Lawrence, and elsewhere, as formerly; and granted liberty to take fish 'on the coasts, bays, and creeks' of the British dominion in general, and to dry and cure them in any unsettled bays, harbors, etc., but otherwise only with the consent of inhabitants or owners of the land. After the war of 1812, the treaty of Ghent, 1815, ignored the subject; the U. S. govt. claimed that the old treaty was still in force, but this Great Britain denied. A convention at London, 1818, granted to fishermen from the U. S. the right to fish on certain parts of the w. and s.w. coast of Newfoundland, on the shores of the Magdalen Islands, and on the coast of Labrador e. and n. of Mt. Toby; to dry and cure fish on Labrador and the s. coast of Newfoundland while unsettled, or otherwise with local consent, as before; and to enter bays or harbors for wood, water, shelter, and the repair of damages. These grants were perpetual, to be merely suspended in case of war. The U. S. govt. renounced the right to take, cure, or dry fish within three m. of any British coast not mentioned.—The 'Reciprocity Treaty' of 1854 confirmed the rights granted in 1818, and conferred further the rights of taking all fish except shellfish, salmon, and shad, on the coasts, and in the bays, harbors, and creeks (but not in the mouths of rivers) of Canada, New Brunswick, Nova Scotia, Prince Edward I., and the neighboring islands, and of curing and drying fish on all these shores. In return, similar rights were secured to inhabitants of the British dominion, on the U. S. coast as far s. as lat. 36°. The St. Lawrence and

Lake Michigan were made free to the navigation of both countries.—The treaty of 1854 was abrogated (according to one of its provisions) 1866, Mar. 17, notice having been given by the U. S. govt. a year previously. This left the treaty of 1818 in force, and the British-American authorities made many complaints of aggressions on the part of fishermen from the states. For five years a state of tension and unpleasantness existed, till the treaty of Washington was negotiated in 1871. By this, most of the provisions of 1854 were revived, but British rights of fishing were limited to lat. 39°. By article 21 free trade was established in fish-oil and sea-fish between the two countries. By article 25 commissioners were authorized to meet at Halifax and determine on the British claim that the United States had been benefited by the concessions to a greater extent than Canada. The commission met in 1877 and awarded $5,500,000 to Great Britain. Article 33 made that part of the treaty which referred to the fisheries (like the treaty of 1854) terminable after ten years on one year's notice by either party. The fishing articles of the treaty of 1871 expired 1885, July 1, but a temporary arrangement was made whereby the privileges accorded American fishermen under those articles were continued during the remainder of that year's fishing season, and after that the industry was again conducted under the provisions of the treaty of 1818. All attempts to arrive at an interpretation, satisfactory to both parties, of Art. I. of the treaty of 1818, were unsuccessful. American fishermen were subjected to numerous vexations, interferences, and annoyances, their vessels were seized upon pretexts regarded in the United States as inadmissible, and they were otherwise treated by Canadian authorities and officials in an oppressive manner. This conduct was justified by Great Britain and Canada by the claim that the treaty of 1818 permitted it, and on the ground that it was necessary to the protection of Canadian interests. In 1886 the U. S. govt. was officially informed that American fishermen would no longer be permitted to ship their fish in bond and free of duty through Canadian territory to the United States, and since then such shipment has been denied. The same year serious difficulties arose over the seizure by the Dominion authorities of vessels from the states engaged in fishing in the waters of British N. America. Retaliatory measures were threatened and in some instances attempted, and public excitement over the situation became widespread and heated. In 1887, May, the U. S. govt. sought an international conference for the purpose of having Art. I. of the treaty of 1818 so clearly interpreted that there should be no further ground for misunderstanding. As a result the United States and Great Britain each appointed three commissioners, who sat in Washington, formulated a new treaty, and signed it 1888, Feb. 15. On the 21st Pres. Cleveland transmitted to the senate the draft with the *modus vivendi*, and all correspondence relating to the subject. On Aug. 21, the senate rejected the treaty by a vote of 27 ayes to 30 nays, and two days afterward the pres. sent a special message to congress regretting the action of the senate and asking for further power to institute measures of retaliation upon Canada. Since then the whole subject has remained in the condition established by the treaty of 1818, excepting that the *modus vivendi* provided (1) that U. S. fishing vessels should be permitted to enter the bays and harbors of the coast of Canada and Newfoundland for the purpose of purchasing bait, ice, seines, lines, and all other supplies and outfits, transhipping catch, and shipping of crews, for a period of two years from date (1888, Feb. 15) by annual licenses at a fee of $1,50 per ton; (2) that if during the continuance of this arrangement, the United States should remove the duties on fish, fish-oil, whale, and seal-oil (and their coverings, packages, etc.), said licenses should be issued free of charge; and (3) that fishing vessels from the states entering the above bays and harbors for any of the four purposes mentioned in Art. I. of the treaty of 1818, and not remaining therein more than 24 hours, should not be required to enter or clear at the Canadian custom-house, providing they did not communicate with the shore. This *modus vivendi* was further extended by the U. S. congress and the Dominion parliament 1890.

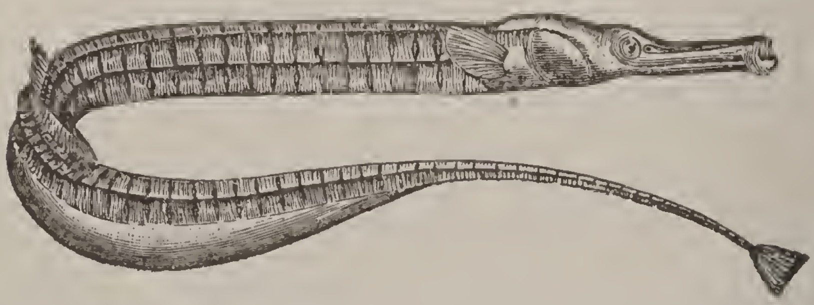
PLATE 1.



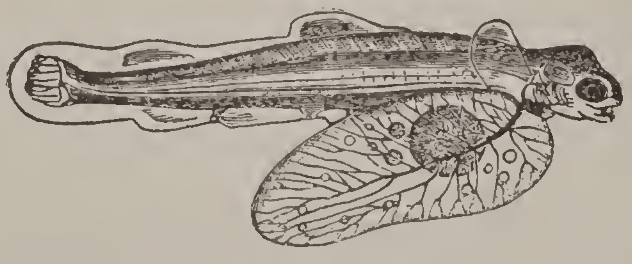
Fishes.—The Origin of Fins: A, Showing the undifferentiated embryonic and probably primitive state, with continuous median and lateral fins; B, Showing the two dorsals, the caudal and anal unpaired fins, and the pectoral and pelvic paired fins.



Fishes.—Internal Anatomy of the Carp, showing the muscle segments where the skin has been removed: *a*, Gills; *b*, Heart; *c*, Liver; *d*, *d*, Swim-bladders; *e*, Intestine; *f*, Ureters.



Fishes.—The Male of a Pipe-fish (*Syngnathus acus*), with pouch beneath the tail, for carrying the eggs.

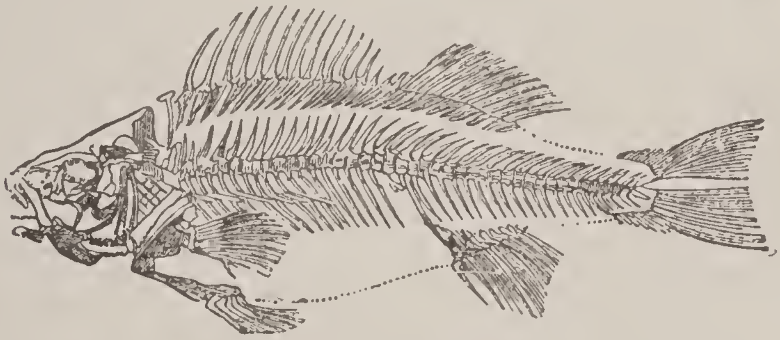


Fishes.—Young bony Fish, with dependent yolk-sac still unabsorbed

FISH'ES (*Pisces*): the fourth—or, according to Milne-Edwards and some other naturalists (see AMPHIBIA), the fifth—class of vertebrated animals; consisting of creatures which, living in water, breathe by gills (*branchiæ*), and not, at any stage of their existence, by lungs. In number—both of individuals and of different kinds—they are supposed to exceed all other classes of vertebrate animals together. Even the water of hot springs and the pools of caverns have their peculiar F., and some of these are known only as thrown out with torrents of muddy water by valcanoes.

The form of F. is generally adapted to easy and rapid progression through water, being more or less nearly that of a spindle, swelling in the middle, and tapering toward the extremities; the outline unangular, and the surface smooth. But exceptions to this rule are numerous; and some, provided with other means of seeking their food, or of preservation from their enemies, exhibit the greatest departures from the ordinary shape: some are globe-shaped, some have a most irregular and angular outline, many are much elongated, as eels; and others are compressed and flattened, as flounders.

The bones of F. differ much in their structure from those of other vertebrate animals, they are less dense and compact, and when their ossification is perfect, remain separate, as in the early embryotic state of the *Mammalia*. The bones of the sub-class of Cartilaginous Fishes (q.v.), whoever, never become properly ossified. The bones of F. generally contain a smaller proportion of earthy matter than those of other vetebrate animals, and their cartilaginous basis contains no gelatine strictly so called. The typical character of the vertebrate skeleton is, however, maintained, though modified; and many of the bones—a great majority, for example, of those of the head—are evidently homologous with those of quadrupeds and of man. There is no neck, and the vertebræ are distinguishable only into abdominal and caudal. The vertebræ are concave at each end, and pierced in the middle, the hollow space being occupied with a gelatinous substance. Spinous processes, sometimes short, sometimes long, extend upward and downward from the vertebræ to support the muscles. F. generally have ribs, connected with the abdominal vertebræ; and in many, an additional set of



Skeleton of Perch.

small bones (*epipleural spines*) connected with the ribs, and arising from near the base of the ribs, extends outward and backward through the lateral muscles. The four limbs which belong to the typical structure of vertebrate animals, assume in F. the form of *Fins* (q.v.), and are generally, though not always, all present, the first pair being the *pectoral,* the second pair the *ventral* fins. In some F., the ventral fins, answering to the hind feet of quadrupeds, are actually further forward than the pectoral fins, and are then called *jugular* fins. In some, as the common eel, the ventral fins are wanting; in some, as the *Murœna,* there are neither pectoral nor ventral fins. Connected with these fins are bones, which show that they represent the limbs of other vertebrate animals. F. have also other fins not so closely connected as these with the internal (*endo-*) skeleton, and not placed like them in pairs toward the sides, but vertically on the middle (*mesial*) line; one or more (*dorsal*) on the back; one or more (*anal*) on the opposite or ventral aspect, behind the anus; and one (*caudal*) at the extremity of the tail. The caudal fin is in general the principal organ of locomotion, and most of the muscles of the body combine to give great energy to its strokes, great part of the body moving with it, and the vertebræ with their processes being so framed as to admit great freedom of lateral, and scarcely any vertical motion. The pectoral and ventral fins seem to serve chiefly for balancing the body, and guiding and staying its motion; the dorsal and anal fins, like the keel of a ship, for keeping it in its proper position. All the vertical fins are supported by bones which do not join those of the internal skeleton, but are thickest at the skin, from which they penetrate toward the vertebræ, being interposed between the spinous processes of the vertebral column. Several of the last caudal vertebræ are generally very short and combined, and the interposed spines which support the caudal fin converge toward them. The *rays* of fins are either pointed bones (spines)—sometimes prolonged beyond the membrane, and forming defensive weapons—or they are cartilaginous and jointed, in which case they often also branch near their summit. The caudal fin never has any other than these soft rays, and many F. have no other in any of their fins. A few F., belonging to different families, have the pectoral fins developed to an unusual degree, so as to make them capable of supporting short flights in the air (see FLYING FISH: FLYING GURNARD); and a few are capable of employing their fins as organs of locomotion in a very different way, creeping along the ground, or hopping among the weeds and stones of the shore.

The heart of F. consists only of one auricle and one ventricle, receiving venous blood only, and sending it to the gills, where, being oxygenated, it passes into the greater of systemic circulation by the dorsal vessel: see CIRCULATION. In most F. there is, close to the heart, a thick *bulb* or muscular swelling of the great artery which conveys the blood from the heart to the gills, and which assists in propelling the blood, being furnished with valves to prevent its regurgitation into the heart; and this bulb and its valves exhibit varieties admirably characteristic of different natural groups, much founded upon in the system of Müller and Owen. The blood of F. is red; its corpuscles are oval and of considerable size, but in general not very numerous. F. consume little oxygen in respiration, and are *cold-blooded* animals, having in general a temperature little elevated above that of the water in which they live; though there are some singular exceptions to this rule, as the tunny, sword-fish, etc., which, having a comparatively high temperature, have also redder blood with more numerous corpuscles. The oxygen appropriated by means of the gills in respiration is obtained not by decomposition of water, but from the air which is mixed in it, hence the necessity of aërating an aquarium; hence also one of the benefits resulting from the agitation of the ocean and of lakes by winds. Some F. require a greater supply of air than they can easily obtain from the water, and frequently come to the surface to breathe. F. taken out of the water die from want of breath, in consequence of the drying up of the fine fringes of the gills; and those which are capable of subsisting longer out of water than others, have generally small gill openings, not so freely admitting the air to dry the gills, while a few are provided with receptacles for water to keep them moist: see ANABASIDÆ.

Cheironectes Caudimaculatus.

The gills of F. are at the back part of the sides of the head, and consist of a multitude of very vascular membranous plates, generally in double fringe-like rows fixed by the base only, and simple, though in a few F. they are feathery, and in the greater number of *Cartilaginous Fishes* (q.v.), they are fixed both by their external and their internal edges, or consist of mere folds of membrane attached to the surface of the gill-cavities. In general, there are four gills on each side; the number is greater in some of the Cartilaginous Fishes. In Osseous F., the gill-plates are attached to the external edge of the branchial arches, bony arches connected with the *hyoid bone* or bone of the tongue —which is unusually developed in F.—and with the base of the skull, the connection at both ends being effected by intervening small bones, and the whole forming a complicated system; while the cavity containing the gills, on each side of the head, is covered by a bony plate, the gill-lid, gill-cover, or *operculum*, with two subordinate pieces, called the *sub-operculum* and *inter-operculum*, articulated on the temporal bone, and playing on the *pre-operculum*, a bony plate placed before them in the head. It is by the motion of these bony plates that the water is expelled which is taken in by the mouth, and which, after passing among the gills, and supplying them with air, passes out by the gill-orifices at the back of the head. Besides these opercular plates or bones, a series of flattened rays, connecting them with the bone of the tongue, and called the *branchiostegal rays,* aid in forming the gill cavities. In the branchiostegal rays, distinctive characters of F. are often found.

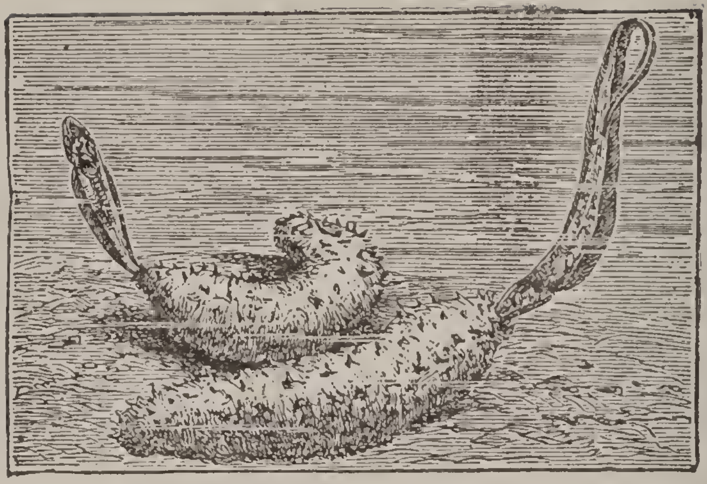
The brain of F. differs very considerably from that of other vertebrate animals: see Brain. In general, they possess the nerves and organs of all the senses, though the senses of touch and taste are commonly supposed to be more dull than in many other animals; and a few F., living chiefly in mud, or in the waters of caverns, are destitute of eyes, and consequently of sight, though even they possess optic nerves, and seem sensitive to light. But in most F., the eyes are large, and vision is evidently very acute; and some have cirri or barbules near the mouth, filaments proceeding from some of the fin-rays, etc., which are regarded as delicate organs of touch, adapted to the wants and habits of the particular species. The eyes are covered by the skin, modified in its character, and have no eyelids nor nictitating membrane. They are very variously placed in different kinds. There is no external ear.

The mouth is the only organ of prehension. It is very different in different kinds—sometimes very small, sometimes extremely large, sometimes forming a sucker by which the fish can both fix itself and pump up the fluids of the animal on which it preys. The snout is also abbreviated, prolonged, or otherwise modified in very various ways. The teeth are far more various in form, number, position, and structure, than in any other class of animals. They never have any roots, but are fixed to the bones which support them; they fall off, however, and are replaced. Some F. have no teeth; some have very small teeth; some have teeth in great number, but so fine as to resemble the hairs of a brush; some have short thick teeth; some have long sharp teeth, either straight or crooked; some have teeth so flat and closely that they resemble a regular and beautiful pavement; and the teeth of F. are sometimes situated not only on the jaw-bones, but on the *vomer* or bone extending along the middle of the roof of the mouth, and indeed, also, on other parts of the palate to the very throat, and very commonly on the tongue. The food of F. is various: a few subsist on vegetable food of different kinds, but most of them on animal food, of which there is no kind that does not seem to be particularly agreeable to some of them from the mere animalcule or the most minute crustacean to the flesh of the mammalia. In general, they are excessively voracious, and seem to spend most of their lives in seeking food. Many of them prey on other F., and many seem equally willing to devour other species or the younger and weaker of their own. Some of them swallow their food almost or absolutely alive; others subject it to processes of comminution, trituration, and mastication in the mouth. Salivary glands are not found in F., though they exist in some of the invertebrate animals. The digestive process seems to be performed very rapidly. The stomach and intestines vary very much in different kinds. The kidneys are in general extremely large, extending through the whole length of the abdomen.

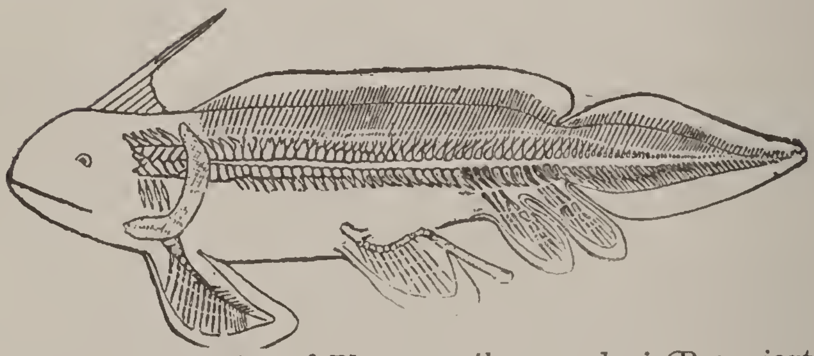
The *air-bladder* is found in many fishes, but not in all; and is present or absent in different F. even of the same genus or family: see AIR-BLADDER. Its uses, and its connection with the habits of particular species, have as yet been but partially ascertained.

F. are oviparous (egg-producing); a few are ovoviviparous (eggs hatched within the body, and young produced alive). The chief reproductive organs are generally two elongated lobes of a fatty substance, *milt*, in the males, and of rudimentary eggs, *roe*, in the females. Impregnation usually takes place after the *roe* or *spawn* is deposited, the male accompany the female to the place of spawning. In some Cartilaginous F., it takes place before the deposition of the eggs; and male sharks and rays are furnished with organs called *claspers*, the use of which is well indicated by the name. The fecundity of F. is generally very great, and their eggs very small in proportion to the size which they ultimately attain, though this is not so much the case in the Cartilaginous F. already mentioned. Some of the F. most valuable to man, as the Salmon, herring, and cod, are remarkable for fecundity. Nine millions of eggs have, according to Leuwenhoek, been ascertained to exist in the roe of a single cod; and provision is thus made both for the preservation of the species amid all the dangers to which the spawn and the young are exposed, and for the wants of man. The spawn of F. is deposited in very different situations, according to the different kinds—as by some on aquatic plants, by some on beds of sand or gravel; but many species leave the depths of the ocean in order to deposit it in shallower waters, and some, usually marine, ascend rivers for this purpose. Very few F. take any care of their eggs or young; but there are remarkable exceptions to this rule, and some of the gobies and sticklebacks are known to tend their young with great care. Sticklebacks also construct nests: see STICKLEBACK. It is not long since this curious fact was discovered, though these little F. have been long familiarly known; and it is

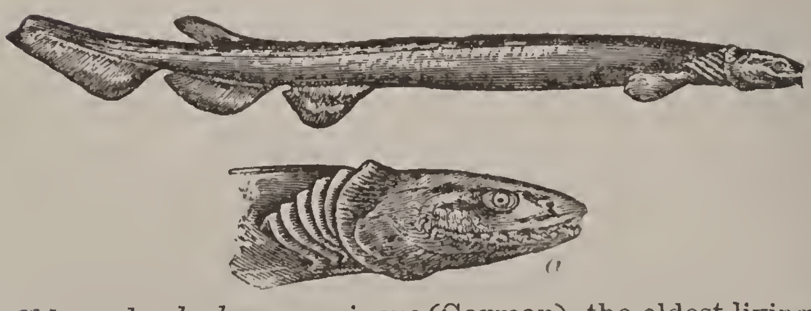
PLATE 2



Fishes.—Fierasfers entering and leaving Holothurians.



Fishes.—Restoration of *Pleuracanthus gaudryi* (Brogniart).



Fishes.—*Chlamydoselachus anguineus* (Garman), the oldest living type of Fishes: *a*, Head on larger scale.

therefore not improbable that many other F. may have the same habit.

The growth of F. is very rapid when supplies of food are abundant, but becomes slow in less favorable circumstances, or is arrested for a long time, in a manner to which there seems nothing similar among other vertebrate animals.

The skin of F. is generally covered with Scales (q.v.), which, however, are sometimes minute and imbedded in the skin, and sometimes altogether wanting. The scales are either horny or bony, and are generally imbricated, like the slates of a roof, their free ends backward; but sometimes form bony plates, fixed by the whole of their lower surface. They usually exhibit beautiful symmetrical markings and inequalities of surface of various kinds, and in some are covered with a thick coat of enamel. The differences of character in the scales have been made the foundation of a classification of fishes by Agassiz, by whom all F. are distributed into the four orders of *Cycloid, Ctenoid, Placoid,* and *Ganoid Fishes* (see these titles), having respectively cycloid, ctenoid, placoid, and ganoid scales; a classification which has been found particularly convenient with reference to fossil F., though other systems maintain their ground against it as preferable for recent species. It is not, however, wholly artificial, for a relation can be very generally traced between the character of the scales and the general structure and economy of a fish. The scales of a row extending from the head to or toward the tail on each side of the body of Osseous F. in a somewhat waved line, called the *lateral line*, are pierced for the transmission of a slimy matter, with which the whole body is lubricated. The colors of fishes depend upon a substance consisting of small polished laminæ, secreted by the skin. As F. need no covering, like fur or feathers, to prevent the dissipation of their animal heat in the surrounding medium, their scales must be regarded chiefly as defensive armor. Some of them are defended also by large bony plates, either on the head alone or also on the body, and some by spines connected with the fins, gill-covers, etc. Few have any other offensive weapons than their teeth, but the spine attached to the tail of some rays is a remarkable exception, as is also the elongated snout or beak of the sword-fish, saw-fish, and a few others. But a much more remarkable kind of armor—probably both offensive and defensive—is possessed by a few F. in an electrical apparatus, by which they can give severe shocks. It is also an interesting fact, that the electrical apparatus is quite different in different fishes possessing it, the Gymnotus or Electric Eel, the Torpedo, and the Electric Silurus or Malapterurus. See ELECTRICITY, ANIMAL.

Many F. are gregarious, swimming in shoals, which in some species consist of immense multitudes. Some also make periodic migrations; salmon, for example, ascending rivers, and herrings and pilchards visiting coasts; but the long migration formerly ascribed to these F. is now doubted or disbelieved. The occasional overland migrations of eels, and the more frequent overland migrations of some tropical fishes, cannot but be regarded with peculiar interest; and the instinct is very wonderful by which, when fleeing from a pool that is about to be dried up, they direct their course toward a place where water is more abundant. This faculty is, however, rare, though possessed by tropical F. both of the eastern and western hemispheres, but more generally the F. destined to inhabit tropical ponds liable to be dried up, are capable of living dormant, imbedded in the mud, till they are liberated again by the rains, when they reappear in their former multitudes.

Of the uses of F. to man, by far the most important is that of supplying food. F. form an article of food in almost all countries, and in some a principal part of the food of the inhabitants. Many F. are highly esteemed for the table, which are not procured in sufficient abundance to be a principal part of food in any country. Some F. on the contrary, are unpalatable; and some, mostly tropical, are poisonous, while others are poisonous only at particular seasons.—The skin of some Cartilaginous F. yields SHAGREEN (q.v.), and the air-bladder of some fishes yields ISINGLASS (q.v.). The minute laminæ which give brilliancy of color to some, and the similar substance found in the air-bladder of others, afford the materials of which artificial pearls are made.—Oil useful in lamps is obtained from a number of F. and the medicinal value of cod-liver oil is well known.

The classification of F. most generally adopted is that of Cuvier, who divides them into OSSEOUS FISHES (having true bones), and CARTILAGINOUS FISHES (q.v.); and divides Osseous Fishes into Acanthopterous Fishes (*Acanthopterygii*, q.v.), and Malacopterous Fishes (*Malacopterygii*, q.v.). The system of Agassiz has already been noticed. That of Müller and Owen differs from both.

Fossil Fishes.—The medium in which F. live, and the hard and almost indestructible nature of some portions of their skeletons—as their teeth, spines, and scales—would lead us to anticipate their frequent occurrence in the Sedimentary rocks; but inasmuch as the soft parts of the animal are liable to speedy decomposition, the remains of fish must often exist in a fragmentary and scattered condition. Thus, the teeth in the shark, the spine defense in the sting ray, and the scales in the bony pike, would survive the total destruction of the cartilaginous skeleton as well as the soft portions of these fish, and would alone remain to testify to their existence. The earliest ichthyic remains are of this fragmentary character. They have been obtained from the 'Ludlow rock,' a member of the Upper Silurian series, and consist of spines and portions of skin, that have been thickly covered with hard tubercles and prickles, like the shagreen of the shark's skin. The spines most nearly resemble the dorsal spine of the dogfish; they are small, flattened, and slightly curved. With similar fragmentary remains, they have been placed under the somewhat indefinite generic title *Onchus*. The minute, compressed, conical, and glistening bodies, called *Conodonts*, obtained in great numbers from the Lower Silurian measures in Russia, and considered by their describer Pander, to have been the teeth of F. belong certainly to very different animals. Their small size and peculiar forms, and the entire margin of the hollow base by which they were attached, show them to have been the denticles from the lingual ribbon of shell-less mollusks, which have left no other traces of their existence than these remarkable Conodonts. The Ludlow bone-bed contains the earliest noticed fish remains. No idea of the numerical importance of F. at this early period can be satisfactorily formed; yet these remains being confined to a single thin bed, and occurring rarely even in that, seem to indicate that the Silurian seas were but thinly tenanted by these earliest sharks. In the immediately succeeding Devonian rocks, their numbers largely increased. The ichthyo-dorulites, or fossil spines of this period, have been referredi to 14 different genera. Numerous species of true ganoids have been determined from their well-preserved enamel scales, which occur singly or in confused groups, and frequently also associated with the head, fins, and tail, so as to present a faithful 'nature-print' of the fish upon the rock: see DIPTERUS: DIPLACANTHUS: etc. But the most remarkable and characteristic fossils of this period are the Buckler-fishes, whose head and part of their body were covered with bony plates, giving them so singular and anomalous an appearance, that some were originally considered crustacean. They are almost confined to the Old Red Sandstone series, a single species (in Permian strata) being the only cephalaspid that is known later. See CEPHALASPIS: COCCOSTEUS: PTERICHTHYS: ETC.

Fish remains are of frequent occurrence in the Coal-measures. More than 20 species of plagiostomous F. have been determined from the spine defenses, some of which are very large and powerful. The frequency with which the peculiar teeth of the cestracionts are found, show that they must have been common in the carboniferous seas. Ganoids also were abundant. See PALÆONISCUS: HOLOPTYCHIUS; etc. In the Permian period, the forms are similar to those in the older strata. Till the last Permian deposit, the fish have all possessed heterocercal tails; but with the Secondary rocks, the homocercal tail not only appears, but becomes the more frequent form, Numerous species and many new forms appear in the Trias and Oolite. Sharks are remarkably abundant in the Cretaceous strata; but the Chalk is remarkable specially from containing the earliest discovered remains of the true bone-F.—those covered with ctenoid and cycloid scales. In the Tertiary strata, the character and proportion of ichthyic remains show a condition in the inhabitants of the water very similar to what at present prevails. The cartilaginous orders decrease, and are replaced by osseous fishes, such as the salmon, cod, turbot, and herring.

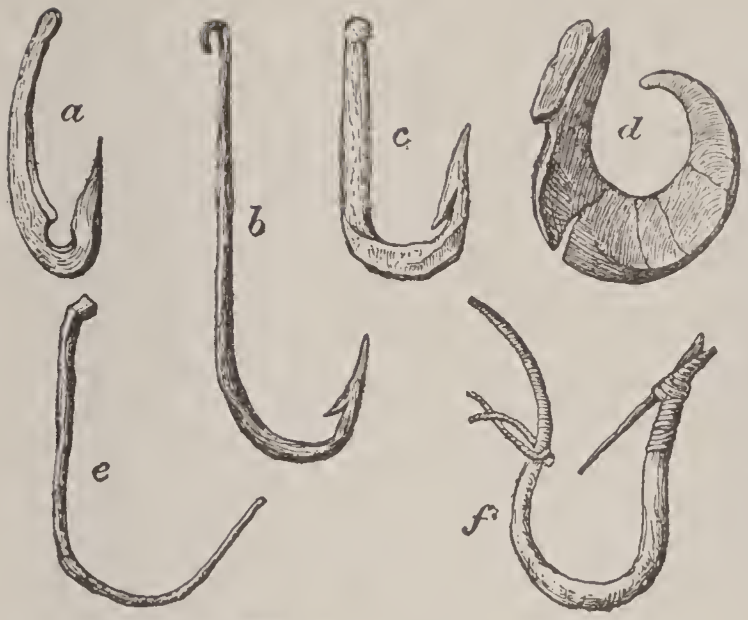
See Günther's *Introduction to the Study of Fishes* (1880), Day's *Fishes of Great Britain and Ireland.*

FISHES, ROYAL: those which at common law are the property of the crown. These are the whale and the sturgeon, when either thrown on shore, or caught near the coast. The ground of the privilege is said to have been the superior value of these fishes. They were considered too precious for a subject, just as the Swan (q.v.), which was a royal bird, was too good for any table but the king's. 'Our ancestors,' says Blackstone, 'seem to have entertained a very high notion of the importance of this right, it being the prerogative of the kings of Denmark and the dukes of Normandy; and from one of these it was probably derived to our princes. The most ancient treatises of law now extant make mention of it.'—Stephen's *Com.* ii p. 547. Strictly, it was the head only of the whale which belonged to the king, the tail being a perquisite of the queen consort (*Ib.* p. 457). In Scotland, whales thrown on shore above six horse-power draught, belong to the queen or her donatary, the admiral.

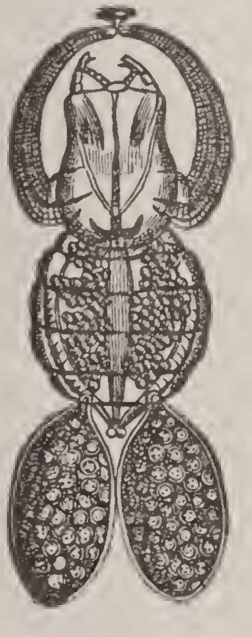
FISH-HOOK: sharp curved implement used in angling (q.v.: see also FISHING). Considerable skill is required for the manufacture of these simple articles. There are two kinds in the market, known as the English, and the Limerick, the latter long in the highest repute among anglers though not so much preferred. Great numbers of fish-hooks are made at Redditch, in Worcestershire, England. Steel-wire is cut into the required lengths, and softened, then the ends of three of these are inserted into shallow holes of a sort of rest or standard, and thus supported, the barbs of all three together are cut up by the skilful pressure of a stout knife; they are then pointed, and turned by pressing them against a little ridge of sheet-brass let into a block of wood, and having the requisite curvature. The other end is next flattened out, by laying it on a small anvil, and striking a blow with a hammer. This is done to prevent the silk-ligature from slipping over the end. The finer worm-hooks have the shanks filed, in order that the silk dressing may not enlarge the shank so much as to prevent the slipping of the worm over it. They are then hardened, and blued. The Limerick hooks are made by cutting the steel, which is made from the best malleable iron, into lengths for two hooks. The ends are then forged out to the shape of barb and point, and the barb is undercut *with a file* from the solid forged end, instead of being cut and turned up with a knife. On this the reputation of the Limerick hooks depended. They are shaped to the required curve by grasping them in circular pliers, and bending the wire with a turn of the wrist. There are other variations in form, prepared by some fishers for certain purposes.

FISH'ING: capture of fishes. F. for food dates from the most remote antiquity, and is probably at least as ancient as the hunting or trapping of any kind of wild animal. The supply of food yielded to man by the waters seems always to have borne a considerable proportion to that yielded by the land. Of all modes of capturing fish, the most simple and primitive is that of taking them with the hand, called in the east of Scotland *gumping*, in the west *ginneling* or *guddling*. Even sea-fish are sometimes taken by the hand,

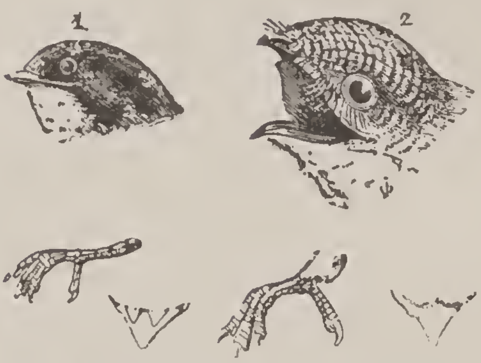
PLATE 3.



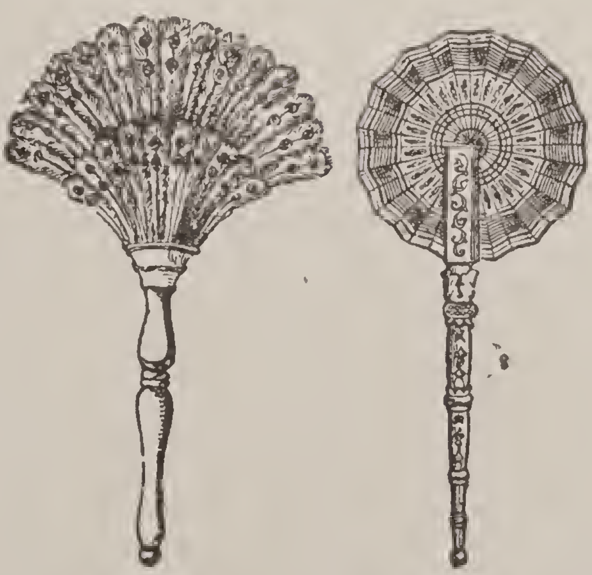
Early **Fish-hooks:** *a*, Lacustrine fish-hook, made of a boar's tusk, found at Moosseedorf, Switzerland: *b*, Bronze lacustrine fish-hook, found at Romanshorn, Lake Constance; *c*, Deer-horn fish-hook, found in Madison County, New York; *d*, Shell fish-hook from Santa Cruz Island; *e*, Cactus-spine Indian fish-hook from Arizona; *f*, Halibut hook, made by the Makah Indians, Cape Flattery, from the knots of the hemlock spruce. — From Rau's *Prehistoric Fishing.*



Fish-louse (*Actheres percarum*), magnified.



Fissirostres. — 1, Diurna: head, foot, and bill of *Hirundo rustica*; 2, Nocturna: head, foot, and bill of *Nyctibius grandis.*



1. Papal **Flabellum.**—Rock's *Church of our Fathers.* 2, Flabellum.—Sommerard's *Arts du Moyen Age.*

approaching the shore in such dense shoals that the water seems almost filled with them. This is particularly the case on the n.w. coast of N. America, where fish appear to abound more than in any other part of the world; and there besides the occasional use of the mere hand, the Indian often catches fish by a hand-net or a basket, paddling his canoe into the midst of the shoal, and as it were baling the fish out of the water. The use of the net, in various forms, and of the hook and line, as well as of the fishing rod, are very ancient. Allusion is made in several places of the Old Testament to the use of nets and hooks in the capture of fish. Some of the most important fisheries, as the herring-fishery, are carried on almost exclusively by the net, but with nets of very different kinds for different fisheries: See FISHERY: NETS; also HERRING: SALMON: and other titles of the most important kinds of fish. The capture of some very valuable kinds of fish—as cod, haddock, and others of the same family—is chiefly by the hook and line; and either by what is called the *long-line*, to which many hooks are attached, and which is extended horizontally over a bank frequented by the fish, the line's place being marked by floats, and the line drawn after the lapse of at least several hours; or by the *hand-line*, which, being let down over the side of a boat with a *sinker* proportioned to the strength of the current, is watched by a fisherman holding it in his hand, and hauled up immediately on a fish being felt to bite. The baits are various, according to the opportunity of procuring them and the kinds of fish. The use of the fishing-rod with the hook and line is not so general for the capture of sea-fish as of fresh-water fish (see ANGLING) though a rude fishing-rod is often used for the capture of some sea-fish. The pollack (q.v.) or lythe, the mackerel, and some other sea-fish are caught often by rod-fishing from boats under sail. The young of the Coal-fish (q.v.) are caught in great numbers by the fishing-rod from rocks on coasts; and this, chiefly an amusement for boys in many places, supplies the inhabitants of Orkney and Shetland, and of some other regions with a considerable part of their food. The shooting of fishes with arrows is practised by some S. American Indians; some very large kinds of fish—as the Arapaima (q.v.)—are occasionally harpooned; and many large fish, both of the sea and of fresh water, are killed by spears—a mode of fish-capture common in parts of Scotland, and much employed by salmon-poachers: the spear—three-pronged—is known as a *leister*. Torches also are used by night in many parts of the world, both in sea and river-fishing, to attract fishes by the light, which in this way has an almost certain effect. The poacher on a Scottish salmon-river conjoins the use of the torch with that of the leister, and this is popularly known as 'burning the water.' It is now wholly illegal in that country, as is the use of the leister under any circumstances. The flying-fish is similarly attracted by torches on the coasts of the South Sea Islands, but a small net is used instead of a fish-spear. The inhabitants of the South Sea Islands take advantage of the habit of some fishes, of leaping out of the water when alarmed, to catch them by means of rafts in the shallow lagoons, encircling them so that they finally leap upon the rafts. The Indians of n.w. America sometimes adopt a similar method of capturing the Viviparous Fish (q.v.) of their coasts. For other peculiar modes of catching fish in use among them, see CANDLE-FISH: SALMON (of N. America). They also take the Vancouver Island herring (see HERRING, VANCOUVER ISLAND) by constructing long dams of lattice-work on flats left dry by the retiring tide, in which the fish are caught which have come in with the tide. This method of taking herring has long been known on the British coasts; and *cruives*, lattice-work constructions of smaller size, have been used with great success in many places. Cruives are very effective also in the capture of salmon, a suitable place of the river being chosen for them, and they being so contrived that the fish readily get in, but do not readily get out. A very peculiar mode of taking fresh-water fishes is practised in Ceylon, by means of a funnel-shaped basket, open at both ends, which is suddenly plunged down, the wider end downwards, till it sticks in the mud, when, if the fish is felt to beat against the sides, it is taken out with the hand.

The capture of fresh-water fish by means of vegetable poisons of various kinds, is practised equally in the E. Indies, in Africa, and in the warm parts of America. The poisons used do not render the fish poisonous. The poisoning of trout and other river-fish with lime is too frequent in some places, is most reprehensible—all the fry, as well as the fish fit for the table, being destroyed, and the mischief often extending much farther down the stream than its perpetrators proceed.

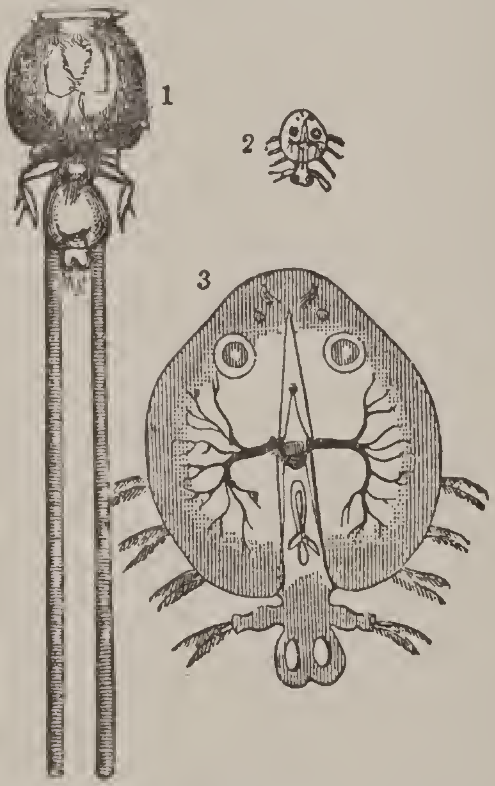
Cormorants are trained by the Chinese for the capture of fish. Otters also have frequently been trained and employed for the same purpose. For a full account of sea-fishing, and the apparatus employed, see *The Sea Fisherman*, by J. C. Wilcocks.

FISH'ING-FROG: see ANGLER.

FISH'ING-TACK'LE: see ANGLING.

FISHKILL, *fish'kil:* town and village of Dutchess co., N. Y.; on the Hudson river and F. creek, and the Hudson River and Dutchess and Columbia railroads; opposite Newburg. The town contains also the villages of F. Landing, Glenham, Matteawan, Carthage Landing, Hughsonville, and part of Wappinger Falls. Pop. of tp. (1900) 13,016. It is 58 m. n. of N. Y., and has Mount Bacon Acad., several churches, a savings bank, two machine shops, and a hat factory. The village is 5 m. n.e. of the Hudson river. Considerable manufacturing is carried on in the villages of F.—F.-on-the-Hudson, or F. Landing, connected with Newburg by a steam ferry, is a popular place of summer resort and residence. Pop. (1878) 2,992; (1880) 2,503; (1890) 3,617; (1900) 3,673.

FISH-LOUSE, or SEA-LOUSE: entomostracous crustacean of the order *Siphonostoma*. All the creatures of this order are small, and are parasitic on fishes, aquatic batrachians, etc., on the juices of which they live, though they have also the power of swimming freely in the water, some of their legs being adapted to this purpose; indeed, they can swim with extreme rapidity, making use of this power to gain that place where they may obtain food at the expense of other creatures. They do not begin life as parasites, the females depositing their numerous eggs on stones, plants, etc. They are animals of singular form and appearance. The genera *Argulus* and *Caligus* are now regarded as the types of two families. In the former, there is a curious sucking disk on each side of the beak or proboscis, though there are also jointed members terminated by prehensile hooks. In the latter, the hooks of the anterior pairs of feet are the principal organs of adhesion to the slippery bodies of the fishes from which food is to be drawn; and the abdomen of the female is furnished with two remarkably long tubes, the functions of which are not perfectly ascertained. The bodies of all are transparent, or nearly so. Some of the *Caligidæ* are common on many kinds of sea-fishes; *Argulus foliaceus* on fresh water fishes, and even on tadpoles. Sickly fishes often become victims of multitudes of these creatures.



Fish-Louse:
1, *Caligus* (female); 2, *Argulus*, natural size; 3, *Argulus*, magnified.

The name fish-louse is sometimes given also to the *Lernæidæ*, but they are very different.

FISK, or FISC, *fĭsk* [see FISCAL]: term often found in Scottish law-books; derived from Latin *fiscus*, literally, a wicker-basket, which came ultimately to signify the privy purse of the emperor, as distinguished from the public treasury which was called *ærarium*. In Scotland, it signifies generally the crown's revenues, to which the movable estate of a person denounced rebel was formerly forfeited. It still gives his name to a very important officer, the procurator fiscal (q.v.), or public prosecutor in the first instance, by whom all crimes are prosecuted before sheriffs and other inferior judges, and whose duty it is to report to crown counsel—i.e., to the lord advocate, or his deputes—all cases which, from their aggravated character, require to be tried by a higher court: see PUBLIC PROSECUTOR.

FISK, CLINTON BOWEN: 1828, Dec. 8—1890, July 9; b. York, N. Y. He removed with his parents to Mich. 1830; received a common-school education, and studied two years in Wesleyan Acad., Albion, Mich.; became a merchant, miller, and banker; and settled in St. Louis, 1858. In 1861 he enlisted as a private in the Union army, going to the field with a St. Louis regiment; shortly afterward returned, recruited the 33d Mo. vols., and was elected col.; was promoted brig.gen. for meritorious services 1863; and brevetted maj.gen. of vols. 1865. He served in the army of the Tenn., took part in the siege of Vicksburg, commanded the 13th div. of the 13th army corps, accompanied the expedition against Fort Pemberton, and commanded the dists. of S.E. Mo., St. Louis, and N. Mo., and the Jefferson city post. At the close of the war he entered the Freedman's Bureau as asst. commissioner, had Ky., Tenn., Ark., Mo., Ala., and Ga. in his dist., and was highly successful in his administration. In 1866 he established a school for freedmen in Nashville, which has since become world-famed as a univ. bearing his name. On the completion of his work among the freedmen in the south, he removed to Seabright, N. J., became pres. of the board of Indian commissioners 1864, prohibition candidate for gov . of N. J. 1886, and prohibition candidate for pres. of the U. S. 1888. He was a liberal promoter and officer of the principal educational institutions of the Meth. Episc. Church.

FISK, JAMES, Jr.: 1835, Apr. 1—1872, Jan. 6; b. Pownal, Vt. He received a meagre education, became a pedler, and was afterward clerk and partner in a large dry-goods store in Boston. In 1863 he removed to New York, started the New York and Boston lines of palace steamboats, bought the Stonington line of Sound steamboats, engaged in the banking and stock business, was elected a director in the Erie railroad 1867, became its vice pres. and treas. with Jay Gould as pres., bought the new Pike's Opera Pouse, establishing the offices of the railroad company in its magnificent apartments, and promoting the presentation of opera bouffe in its grand theatre, and became col. of the 9th regt. N. G. S. N. Y. His career in New York was one of boldness, dash, and continual excitement. He organized and equipped a band of 100 pieces for the regt., personally collected many large wagon-loads of supplies for the sufferers by the Chicago fire 1871, and rushed two relief trains from New York to the stricken city before the conflagration was extinguished. He was unscrupulous, impulsive, shrewd, and even brilliant in his transactions; and met his death at the hands of Edward S. Stokes, who accused him of attempting to ruin him in some oil dealings.

FISK, WILBUR, D.D.: 1792, Aug. 31—1839, Feb. 22: b. Brattleborough, Vt.; son of Judge James F. He graduated at Brown Univ. 1815, began studying law, but was forced to abandon it by serious illness; entered the itinerant ministry of the Meth. Episc. Church 1818, and soon achieved wide fame as a pulpit orator. He removed to Charlestown, Mass., 1819, was ordained deacon 1822, and was presiding elder of the Vt. dist. 1823–27. In 1826 he was chaplain of the Vt. legislature, 1826–30 was the first principal of Wilbraham Acad., Mass., and 1830 was elected first pres. of Wesleyan Univ., Middletown, Conn. He was active in organizing Wilbraham Acad., Wesleyan Univ., and the Or. Indian mission; visited Europe for his health 1835–6; was elected bp. of the Meth. Episc. Church but declined 1836, and became a member of the Conn. state board of education 1839. Besides an account of his European travels, he published *Inaugural Address* (New York, 1831); *Calvinistic Controversy* (1837); *Sermons and Lectures on Universalism; Reply to Pierpont on the Atonement;* and other theological and educational works. He received the degree D.D. from Augusta College, Ky., 1829, and Brown Univ. 1835.

FISKE, FIDELIA: niece of Pliny F.: 1816, May 1—1864 Aug. 9; b. Shelburne, Mass.: missionary. She graduated at Mount Holyoke Seminary 1839, and was a teacher there till 1843, when she became a missionary to the Nestorians of Persia. She labored in that field with great zeal 15 years, passing the greater part of the time as a teacher, and becoming the first principal of the seminary at Oroomiah. She returned home with health seriously impaired 1858, published a *Memorial of Mount Holyoke Seminary,* and *Woman and her Saviour in Persia,* and was preparing recollections of Mary Lyon, her early seminary friend, at her death.

FISKE, JOHN: 1744, Apr. 10—1797, Sep. 28; b. Salem, Mass.: naval officer. He was bred to the sea, and 1776, July 8, was commissioned capt. of the *Tyrannicide,* the first war vessel equipped by the state of Mass., with which he rendered the patriot cause important service. In 1777, Dec., he was given command of a larger state vessel, the *Massachusetts.* He served till the close of the war; then engaged successfully in commercial pursuits, and became a state official and maj.gen. of militia.

FISKE, JOHN, A.M., LL.B.: author: b. Hartford, Conn., 1842, Mar. 30. His name was originally Edmund Fiske Green, but he took that of his maternal grandfather 1855. He graduated at Harvard Univ. 1863, and Harvard law school 1865; was admitted to the bar but never practiced. In 1869 he was appointed lecturer on philosophy at Harvard, 1870 instructor in history, and 1872 asst. librarian. He was elected an overseer 1879 and 85, has been lecturer on

American history in Washington Univ., St. Louis, since 1881, and prof. of that branch there since 1884; and was lecturer on the subject in University College, London, 1879, and in the Royal Institution of Great Britain 1880. He was associated with Gen. James Grant Wilson in editing *Appleton's Cyclopædia of American Biography*, 6 vols. (New York, 1886–89). He has published *Tobacco and Alcohol* (1868); *Myths and Myth-Makers* (1872); *Outlines of Cosmic Philosophy, based on the Doctrine of Evolution* (1874); *The Unseen World* (1879); *Darwinism and Other Essays* (1879–85); *The Destiny of Man Viewed in the Light of his Origin* (1884); *The Idea of God as affected by Modern Knowledge* (1885); *American Political Ideas viewed from the Standpoint of Universal History* (1885); and a *History of the American People* (1889). Mr. F. is a clear and strong reasoner and instructive writer. He died 1901, July 4.

FISSEL: see Fissle.

FISSENLESS, a. *fĭs'ĕn-lĕs* [see under Foison]: in *Scot.*, destitute of substance or pith; foisonless; tasteless.

FISSICOSTATE, a. *fĭs-sĭ-kŏs'tāt* [L. *fissus*, pp. of *findo*, I cut, I cleave; Eng. *costate*]: having the ribs divided.

FISSIDENS, n. *fĭs'sĭ-dĕnz* [L. *fissus*, cloven; *dens*, a tooth]: in *bot.*, typical genus of the family *Fissidenteæ*, a tribe of operculate apocarpous mosses.

FISSILE, a. *fĭs'sĭl* [L. *fissĭlĭs*, that may be split—from *fĭssŭs*, cleft: It. *fissile*]: capable of being split—applied to rocks which, like clay-slate, can be split or divided into thin layers. Fissil'ity, n. *-sĭl'ĭ-tĭ*, the quality of admitting to be split in thin leaves.

FISSILINGUIA, n. *fĭs'sĭ-lĭng'gwĭ-ă* [L. *fissus*, cleft; *lingua*, the tongue]: a division of Lacertilia or lizards having bifid tongues.

FISSION, n. *fĭsh'ŭn* [L. *fissus*, cleft or split]: a cleaving or splitting into parts. Fissipara, n. *fĭs-sĭp'a-râ* [L. *părĭŏ*, I bring forth]: animals propagated by fission. Fissip'arous, a. *-a-rŭs*, applied to the multiplying or increase of certain animal forms by the self-division of the individual into two or more parts, each of which becomes a perfect creature similar to the parent-original; in *bot.*, dividing spontaneously into two parts, by means of a septum.

FISSIPALMATE, a. *fís-sĭ-păl'māt*, [L. *fissus*, cleft, divided; Eng. *palmate*]: having the membranes between the toes deeply cleft or incised, as in the foot of a grebe.

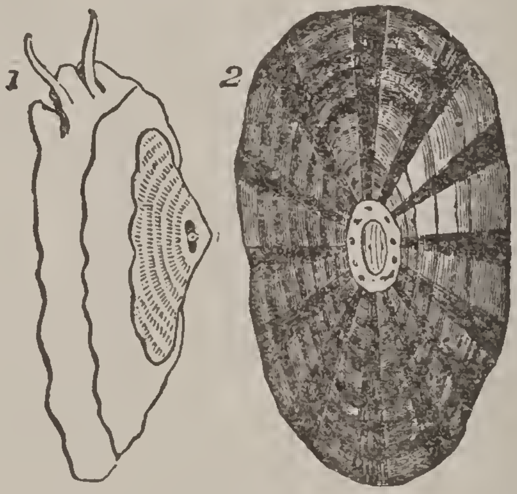
FISSIPED, a. *fĭs'sĭ-pĕd:* having separate toes; cloven footed: N. animal having the toes separate or not connected by a membrane, as in the carnivorous mammals, *Felidæ*, *Canidæ*, etc.

FISSIROSTRES, n. plu. *fĭs'sĭ-rŏs'trēz* [L. *fissus*, cleft *rostrum*, a beak]: sub-order or tribe of birds, in the great order *Insessores*. It is characterized by peculiar width of gape, the bill is and depressed or horizontally flattened, short, and often furnished with strong bristles at the angles; the birds of this tribe being insectivorous, and generally subsisting by catching insects on the wing, to which this structure of bill is beautifully adapted. The powers of flight are generally great, but the legs are short and weak. Swallows and goat-suckers are familiar examples of this order.

FISSLE, v. *fĭz'zl* [a freq. from *fuss*]: to make a slight, continued, rustling noise.

FISSURE, n. *fĭsh'ûr* [F. *fissure*—from L. *fissūră*, a cleft or slit]: a crack or cleft; a slit from the parting asunder of any substance: V. to open as a fissure. Fissured, pp. *fĭsh'ûrd*, cracked; full of cracks.

FISSURELLIDÆ, *fĭs-sūr-ĕl'ĭ-dē:* family of gasteropdous mollusks, of the order *Scutibranchiata*. The shell omuch resembles that of the limpet family (*Patellidæ*), but has either a hole at the apex, or a slit at the front margin. The hole at the apex characterizes the genus *Fissurella* (Keyhole Limpets), and the slit appears in the genus *Emarginula*. These openings of the shell are subservient both to the passage of the water requisite for respiration, and the discharge of the excrements. The fissurellidæ resemble limpets in their habits, and are found either on the sea-shore or at no great depth. They are widely distributed over the world.



Fissurella:
1, the animal; 2, the shell.

FIST, n. *fĭst* [OE. *fust;* Ger. *faust*, the hand as an instrument of striking: Swiss, *fausten*, to beat: Dut. *vuist*, the fist: L. *fustis*, a stick]: the hand with the fingers doubled into the palm; the closed hand: V. in *OE.*, to strike with the fist; to gripe or clutch closely and firmly with the hand. Fist'ing, imp. Fist'ed, pp. Fisty, a. *fĭs'tĭ*, connected with the fist; pugilistic. Fist'ic, a. *-ĭk*, pertaining or relating to boxing or pugilism; pugilistic. Fistiana, n. *fĭst-ĭ-ân'a*, collection of anecdotes and information relative to pugilists and the prize ring; boxiana. Fisticuffs, n. *fĭs'tĭ-kŭfs*, battle with the fists.

FISTUCA, n. [L. a rammer]: a pile-driver; a monkey.

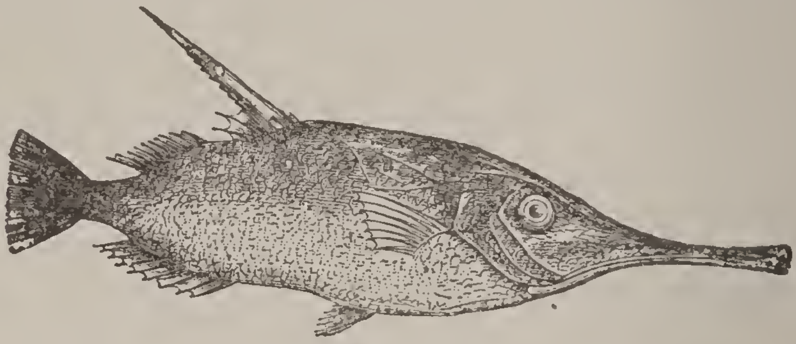
FISTULA, n. *fĭs'tū-lă* [L. *fĭstŭlă*, a hollow reed: It. *fistola:* F. *fistule*]: a deep, narrow ulcer or sore: Fis'tulated, a. *-lā-tĕd*, made hollow like a pipe. Fis'tulous, a.

-lŭs, of the nature of a fistula; in *bot.*, hollow, like the stems of grasses; also FIS′TŬLAR, a. *-lėr.—Fistula*, in former times, was applied, in its etymological meaning of a *pipe*, to such abscesses (q.v.) as had contracted to narrow, hard, open passages in the soft texture of the body (see TISSUE), lined by a kind of false membrane, giving rise to a thin discharge. At the present time, the term is generally limited to the opening of such a passage in close contact with a mucous membrane. Thus, it is common to speak of salivary, urinary fistula, etc.; and the most common and troublesome kind of all is the fistula in ano, in connection with the lower bowel, or rectum (q.v.). The treatment of fistula should be intrusted only to experienced surgeons; but there are always quacks in abundance willing to undertake it, and hold out flattering hopes of an early cure without proper surgical procedure.

For the cure of salivary or urinary fistula, all that is generally necessary is to restore the patency of the ducts, which is done by passing instruments along them. Should a fistula, however, be where it is surrounded by muscular fibres, as at the orifice of the lower bowel, it is necessary to divide these muscular fibres, so as to leave the part at rest while nature repairs it. As the sinus, which is the continuation inward of the fistula, is lined with imperfectly organized lymph, it is generally necessary to stimulate the part by the introduction of lint, either alone or saturated with some irritant, such as the sulphate of zinc, which, mixed in the proportion of 1—3 grains to each ounce of water, and colored with lavender, makes the famous red lotion of the shops.—At times, however, fistulæ require more elaborate treatment, and are extremely difficult to close, especially those which result from loss of tissue between two adjacent mucous canals; fortunately, however, modern surgery is able to remedy these also. It is necessary to make the edges of the orifice once more raw, and to bring them in contact; but formerly the wound used rarely to unite, as the stitches produced too much irritation. Now, however, by the use of silver or iron wire, the parts can be kept together long enough to insure union; and thus, by the ingenuity of American surgeons, especially Dr. Marion Sims of New York, and others in Great Britain, certain diseases of women, arising from protracted labors, and formerly rendering the unfortunate subjects of them miserable and unfitted for the duties of life, may be now remedied by a skilfully performed but almost painless proceeding.

Fistula, in farriery, is a chronic abscess affecting horses, deep-seated, discharging through pipe-like openings. It appears on the withers or on top of the head; in the latter place, called poll-evil. It is caused by blows, galls, accidental injuries, and neglect. Treatment: caustic applications. If the F. be obstinate, it may be necessary to cut the walls of the pipe and wash in antiseptic solutions. F. should be attended by a veterinary surgeon.

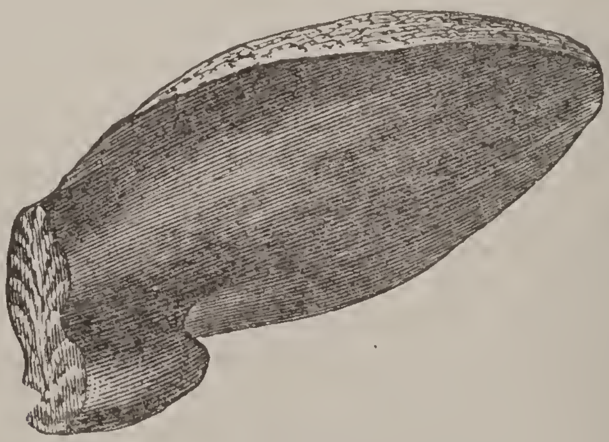
FISTULARIDÆ, *fĭst-ū-lăr′ĭ-dē*, or AULOSTOMIDÆ, *aw-lŏs-tŏm′ĭ-dē*, or FLUTEMOUTHS. *flūt′mowthz:* family of acanthopterous fishes, remarkable for the conformation of the head; the skull being elongated into a tube, at the extremity of which are the mouth and jaws. The species all are marine; they are widely distributed; a specimen is the snipe-fish, sea-snipe, or trumpet-fish (*Centriscus scolopax*).



Snipe or Trumpet Fish (*Centriscus scolopax.*)

These fishes are not to be confounded with the pipe-fishes, which have similar elongation of snout, but are otherwise very different.

FISTULINA, *fĭst-ū-lī'na:* genus of fungi allied to *Boletus* (q.v.); the under surface (*hymenium*) at first covered with minute warts, which ultimately form tubes. *F. hepatica* is common throughout Europe on old oak, walnut, and chestnut trees; it occurs also on ash and beech. It is semicircular, of very regular outline, with a lateral stem, or none; its color red; its substance fibrous and fleshy, much resembling beet-root. When old and beginning to decay, it looks like a mass of liver. It sometimes attains great size. Dr. Badham describes a specimen nearly five ft. round, and weighing eight pounds. Mr. Berkeley mentions one which grew on an ash pollard, and



Fistulina Hepatica.

weighed nearly 30 pounds. This fungus is much esteemed in parts of Europe as an esculent; it is wholesome and nutritious; and the abundance in which it may often be procured, makes it more worthy of regard; while there is almost no possibility of confounding it with any dangerous fungus. Its taste resembles that of the common mushroom, but is rather more acid. 'When grilled, it is scarcely to be distinguished from broiled meat.' It furnishes itself with abundance of sauce.

FIT, n. *fĭt* [It. *fiata;* OF. *fiede,* intermittent period, turn: prov. Sw. *futt,* a very brief interval of time: Ger. *fit,* an int. expressive of sudden disappearance, or of pain: mid. L. *ficta,* a pang]: popular name for convulsions (q.v.); any sudden attack of disease in which the body is often convulsed or deprived of sense; a temporary affection or attack of pain or illness; sudden and considerable disorder of the mind. Fit′ful, a. *-fûl,* marked by sudden impulses or starts. Fit′fully, ad. *-lĭ.* Fit′fulness, n. By fits and starts, intermittently; only done at intervals, and with fickle or changeable purpose.

FIT, n. *fĭt* [F. *faict,* wrought or fashioned for a purpose: Dut. *vitten,* to square, to fit: comp. Icel. *fitja,* to knit together: L. *factus,* made]: close and easy setting of a dress: Adj. suitable; convenient; becoming; qualified; right: V. to suit one thing to another; to adapt; to qualify for; to be proper or suitable. Fit′ting, imp adapting; qualifying: Adj. appropriate; becoming; suitable. Fit′ted, pp. Fit′ly, ad. *-lĭ.* Fit′ness, n. qualification; adaptation; meetness propriety; convenience. Fit′tingly, ad. *-lĭ.* Fit′tedness, n. suitableness. Fit′ter, n. one who puts parts together, as machinery. To fit out, to furnish with necessaries. To fit up, to prepare for reception or use.—Syn. of 'fit, a.': meet; adapted; adequate; prepared; proper; appropriate; expedient; congruous; correspondent; apposite; apt; adapted; competent.

FIT, n. *fĭt* [AS. *fitte,* a song; *fittian,* to sing: Icel. *fet,* a pace, a foot in poetry: Gael. *faidh,* a prophet or bard]: in *OE.*, part of a song or poem; a canto; a division of a song or dance.

FITCH, n. *fĭch* [It. *veccia*]; the vetch; a chick-pea; the *Vĭcĭă sătīvă,* ord. *Legumĭnōsæ,* the common vetch or tare; *Nĭgĕllă sătīvă,* ord. *Ranŭncŭlācĕæ,* the supposed fitches of Scripture.

FITCH, *fĭch,* Eleazar Thompson, d.d.: 1791, Jan. 1—1871, Jan. 31; b. New Haven: theologian. He graduated at Yale Univ. 1810, taught school two years, pursued advanced studies in Andover Theol. Seminary, and preached 1812–17, and then succeeded Pres. Dwight as prof. of divinity in Yale. His success was so large that the corporation were induced to organize a full theol. dept., 1822; and in this he had charge of the branches of homiletics, natural theol., and evidences of Christianity, besides filling the office of college preacher and pastor (Congl.) till 1852. Though compelled by ill-health to resign his more active labors, he retained the office of lecturer on theol. till 1861, and was prof. emeritus of theol. till death. His sermons have been published, and are notable for grasp of thought.

FITCH, James: 1622, Dec. 24—1702, Nov. 18; b. Bocking, Essex, England: clergyman. He received a classical education; removed to New England, 1638; studied seven years with the distinguished ministers Hooker and Stone; became pastor of the First Church (Congl.) in Saybrook, Conn., 1646; and, after 14 years' service there, was installed as the first minister of the church in Norwich He learned the language of the Mohegan Indians, and was popular among them, preaching to them in their own tongue, sharing his land with them, and teaching them agriculture.

FITCH, John: 1743, Jan. 21—1798, July 2; b. Windsor, Conn.: inventor. He attended a dist. school a short time, studied surveying, was apprenticed to a watch and clock maker, was driven from home by family cruelty, engaged in the foundry business and the manufacture of potash, and, removing to Trenton, N. J., 1769, established himself as a silversmith and watch and clock maker. During the early part of the revolutionary war he was the chief gunsmith for the colonial armies, but, when the British took Trenton, they destroyed all his property. He then became a lieut. in the N. J. vols., and, after the Valley Forge winter, re-established himself as gunsmith. In 1780 he was appointed a deputy surveyor for Va., spent a year in making surveys in the w. wilderness, returned to Philadelphia, 1781, made another journey to the w. with a party of ten emigrants 1782, was attacked by Indians at the mouth of the Muskingum river, escaped from captivity, and reached Warminster, Penn., the next spring, penniless. While stopping in Warminster, he rudely cut, on a piece of board, a diagram of the country that he had traversed, and obtained a number of impressions from it by means of a cider-press, thus becoming the first American wood-engraver. In 1785 he completed a model of a boat to be propelled by steam, with sidewheels, and petitioned both congress and the Penn. legislature for aid in constructing a working-boat. In 1787 he was enabled to form a stock company and build *The Perseverance*, which made 3 miles per hour on Del. river, and contained the first double-acting condensing engine transmitting power by means of cranks, ever constructed. A second boat was tested, 1788, Aug. 22, at Philadelphia; a third, 1788, Oct.; and a fourth, 1790, Apr.; the latter being run through the summer as a passenger-boat between Philadelphia and Burlington at a speed of 8 m. an hour. At the height of his experiments his private resources gave out, his stockholders became discouraged, and he was forced to abandon his project. In 1793 he went to France to build a steamboat, but the Revolution prevented, and he returned home penniless and as a common sailor. He made several unavailing attempts to secure money to perfect his inventions, and in grievous disappointment ended his life by poison at Bardstown, Kentucky.

FITCHBURG, *fĭch'bĕrg:* city, one of the capitals of Worcester co., Mass ; on the Nashua river; at junction of the F., the Boston Clinton and F., and the Vt. and Mass. railroads; 24 m. n. of Worcester, 30 m. w of Lowell, 50 m. w.n.w. of Boston. It is built on a series of hills, of which Mount Rollstone, a mass of granite with forest-clad sides 300 ft. above the railroad track and 434 ft. above tide water, is chief. It has an excellent system of water works, a paid fire dept. with steam engines and electric fire-alarm telegraph, 4 national banks (cap. $950,000), 2 saving banks, 12 churches, high, grammar, and primary schools, public library, co. hall, 2 daily and 2 weekly newspapers. F. contains numerous and important manufacturing establishments, including 10 paper-mills, several steam-engine, chair, piano, woolen goods, agricultural implement, and rattan factories, and a number of choice granite quarries and works. The chair, paper, machinery, and woolen goods products reach an annual value of $4,600,000.—The proprietors of 'Turkey Hills' were incorporated as a town 1728, Aug. 1, to which the name of Lunenburg was given in honor of King George II., who was also Duke of Lunenburg in Germany. F. was set off and incorporated as a separate town, 1764, Feb. 3, and named after either Col. Timothy Fitch, a wealthy merchant of Boston, who owned considerable property there, or John Fitch, chairman of the committee that secured the separation from Lunenburg. Ashby was set off and incorporated 1767. F. received a city charter 1872, Mar. 8. Water was introduced from Scott and Shattuck brooks 1871, and the Board of Trade was organized 1874. Pop. (1870) 12,289: (1880) 12,429; (1885) 15,375; (1890) 22,037; (1900) 31,531.

FITCHET, n. *fĭch'ĕt*, or Fitchew, n. *fĭch'ū* [OF. *fissau;* old Dut. *fisse* and *vitsche*, a polecat: comp. L. *fœtērĕ*, to stink]: the polecat or marten: see Polecat. Fitch-brush, n. brush or hair-pencil made of the fur of the polecat; are prized by artists, as elastic and firm though soft, and as capable of being brought to a fine point.

FITCHY, *fĭtch'ĭ*, or Fitché, *fĭtch'ā*, in Heraldry: said of crosses whose lower branch ends in a point.

FITMENT, n. *fĭt'mĕnt* [see Fit 2]: in *OE.*, a thing adapted to a particular purpose.

FITZ, *fĭts* [Norm. F. *fiz*, the *t* having been inserted to preserve the old Norm. F. sound of $z = ts$—from L. *fĭlĭus*, a son]: old Norman word signifying 'son,' 'son of.' Like the Scotch *Mac*, the Irish *O'*, and the Oriental *Ben*, it is prefixed to proper names to signify descent, as in the Norman names Fitzwilliam, Fitzwalter, Fitzgerald. A later application of it has been to denote the natural sons of royalty, as in Fitzroy, Fitzjames, and Fitzclarence. The Russian termination *witch* or *vich* is a disguised form of the same word.

FITZGERALD, *fĭts-jĕr'ald*, Edward, Lord: 1763, Oct. 15—1798, June 4; b. near Dublin: Irish patriot. He was younger son of the first Duke of Leinster, who died when Edward was 10 years old. His mother subsequently married Mr. Ogilvie, and the family removed to France, where Edward was educated for the military profession. In 1779 he returned to England, and entered the army, and two years later accompanied Lord Rawdon to America as aide-de-camp. During his service in the war of the revolution he distinguished himself by personal bravery, strategic skill, and humane instincts. He was wounded at Eutaw Springs, and, after Cornwallis's surrender at Yorktown, was transferred to the staff of Gen. O'Hara, with whom he served at St. Lucia. In 1783 he returned to Ireland, was elected member of the Irish parliament for Athy, and, recognizing the hopelessness of giving his country practical service withdrew from parliament, and made a prolonged journey to the s. of Europe and to America. In 1796 he joined the party of 'United Irishmen,' became pres. of the organization, was sent to France to negotiate a treaty with the Directory for a French invasion of Ireland, was captured and died in prison.

FITZ GERALD, James N.: an American clergyman; b. 1837, July 27; was admitted to the bar, 1858. He united with the Meth. Epis. church, 1861, and in the following year joined the Newark Conference. For 18 years he was pastor and presiding elder in that conference, of which he was also secretary for 10 years. In 1881-8 he was recording secretary of the Missionary society of his church. In 1888 he became a bishop, and in 1897 was elected president of the Ocean Grove Camp Meeting Association.

FITZGERALD, Oscar Penn: an American clergyman; b. 1829, Aug. 24; received a common school education in North Carolina, his native state. He then entered a printing office in Virginia, but later abandoned that business and went to Georgia, where he became a minister in 1853. Two years later he removed to California. He was for some time editor of the *Pacific Methodist and Christian Spectator*. In 1867-71 he held the post of superintendent of public instruction of California, and was ex-officio editor of the *California School Journal*. In 1878 he was elected editor of the *Nashville Christian Advocate;* became bishop of the Meth. Epis. Church, South, 1890. He wrote *California Sketches; A Life Study; Eminent Methodists; Judge Longstreet*, etc.

FITZGERALD, Thomas, Lord: abt. 1514—1536, Feb. 3; b. Kildare: Irish revolutionist. He was son of Gerald, 9th earl of Kildare and lord deputy of Ireland, accompanied his father when summoned to London to answer charges of official maladministration 1534, and, after his father's committal to the Tower, was sent back to Ireland as vice-deputy, and with secret instructions to foment rebellion against the king of England. He gathered a large body of daring men around him, took possession of the city of Dublin, and laid siege to the castle, to which the English govt. had fled for safety. At this juncture the primate, Abp. Allen, who had been charged specially by Henry VIII. to watch and report events, undertook to sail for Eng.; but the vessel ran aground and the abp. his chaplains, and attendants were seized by F. and murdered. While still besieging Dublin castle, his domains were invaded by the Earl of Ormond, and to protect them he had to abandon the siege. He sought in vain to seduce Ormond from his allegiance, took a treacherous advantage of him under a truce, and finding the gates of Dublin shut against him on his return, laid siege to the city. In Oct. Ormond again invaded Kildare, and F. raised the siege to attack him, but, while on the march, an English army was landed at Dublin, and F. retired to the country. Soon afterward he made a dash toward Dublin and burnt two villages near by. In 1535, Mar., Skeffington, the new deputy, attacked the castle of Maynooth, the principal stronghold of the revolutionists, when F. retreated into Thormond, whence he purposed journeying to Spain to plead in person with the emperor for assistance. He changed his mind, however, and wandered about the country till a price was set on his head, when he surroundered unconditianally, was taken to England, and, with his five uncles, committed to the Tower and hung for treason at Tyburn. His father died in the Tower after hearing of his son's rebellion and excommunication, but Thomas did not assume the title.

FITZHERBERT, *fĭts-hĕr'bĕrt*, MARIA: married to the Prince of Wales, afterward George IV.: 1756, July—1837, Mar. 29; daughter of Waller Smythe, of Bambridge, Hampshire. She married first Edward Weld of Dorset, and, after his death, Thomas Fitzherbert of Stafford (d. 1781). In 1785, Dec., she was married to the Prince of Wales in private by a regular clergyman of the Church of England; but the union was legally invalid because of the statute prohibiting marriage between a prince of the royal blood and a subject. George afterward married the Princess Caroline of Brunswick, and, on his separation from her, lived with Mrs. F. till his excesses forced her to leave him. She retired to Brighton and received a govt. pension till death.

FITZSIMMONS, *fĭts-sĭm'onz*, THOMAS: 1741–1811, Aug.; b. Ireland: merchant. He settled in Philadelphia and engaged in mercantile business, raised a company of volunteers and commanded it during the revolutionary war, joined his partners in subscribing $25,000 for army supplies 1780, was several times a member of the Penn. assembly, delegate to the continental congress 1782–3, and to the constitutional convention 1787, member of congress 1789–95, and pres. of the chamber of commerce of Philadelphia, and of the N. American insurance company.

FIUME, *fē-ō'mā* (in the Illyrian language, *Reka* or *Rika;* Latin, *Fanum St. Viti ad flumen*): important seaport of Austria, at the efflux of the Fiumara into the Gulf of Quarnero, in the Adriatic; 40 m. s.e of Trieste, across the Istrian peninsula; lat. 45° 20′ n., and long. 14° 26′ c. F. has quite the character of a German town, is adorned with many handsome buildings, and consists of an old and new town, which together contain (1890) 30,337 inhabitants. It has manufactures of tobacco, paper, ropes, Whitehead torpedoes, and a flourishing trade in ship-building. F. has a fine quay, with a light-house, and its commerce is of late increasing. It has been a free port since 1722; and in 1849 was severed from Hungary with the territory to which it belongs, but since 1870 is again under the Hungarian administration.

FIVE, a. n. *fīv* [Icel. *fimm;* Goth. *fimf;* Ger. *fünf;* Dut. *vijf;* L. *quinque;* Gr. *pente*, five: Skr. *panchan*, five —from *pâni*, a hand: Pers. *pendji*, five—from *pentcha*, hand]: four and one. FIVE-FINGER, in *bot.*, *Potentilla reptans;* cinquefoil. FIVE-FINGERS, n. in *zool.*, name given by oyster-fishers to two species of star-fish, *Uraster rubens*, and *Solaster papposus;* in *cards*, name given to the five of trumps. FIVE-FOLD, a. ad. five times repeated. FIVE-points, n. the five leading tenets of Arminianism: see Arminius; the five leading tenets of Calvinism (q.v.). Fiver, n. *fī′vėr, familiarly*, anything which counts by fives, generally said of a five pound note. Fives, n. plu. *fīvz*, a game like tennis (see below).

FIVE FORKS, Battle of: 1865, Apr. 1, in Dinwiddie co., Va.; at junction of the White Oak, Ford's, and Dinwiddie Court-house roads; near (and s.w. of) Petersburg. The Confederates regarded the point as of such great strategic value that Gen. Lee detached from his army a force of 15 000 men to hold it and so maintain railroad communication between his army at Petersburg, and Richmond. Gen. Sheridan attacked the Confederates at F. F., Mar. 30, 31 and had a brief season of success on the second day; but the roops that had been engaging the Union force under Gen. Warren on the White Oak road hastened to the relief of those at F. F., and the combined army drove Sheridan back toward Dinwiddie Court-house. On the following day Sheridan reinforced and with an effective command of about 20,000 men, renewed the attack, with his cavalry forced the enemy within his works, held him there by a feint movement on his right, struck his left flank with the Fifth corps, and thus separated the whole Confederate force from Petersburg The right of the intrenchments was carried and over 1,000 prisoners taken, the works on the left and rear were then secured with 1,500 prisoners, and late in the afternoon the entire Confederate force was surrounded and had no alternative but surrender. Four guns and upward of 5,000 prisoners were taken, at a Union loss of 1,000. Gen. Lee abandoned Petersburg the next day and surrendered his army the next week.

FIVE HUNDRED, Council of: one of two councils in France, instituted by the constitution adopted 1795, Sep. 23. It was composed of 500 members, and only such were eligible as had been residents in the country 10 years, and were at least 25 years old (30 years after 1798). One third the members were chosen annually. The duty of the council was to propose laws. 42 of its members were expelled in 1796, but it thrived under the Jacobins, and was forcibly dissolved by Napoleon 1799.

FIVE-MILE ACT: see Congregationalism.

FIVES, n. plu. *fīvz:* an OE. spelling for Vives, which see.

FIVES, *fīvz:* popular game in England, especially with schoolboys, and, in certain barracks where there is a 'court,' with soldiers. The game existed at a very early period—14th c.—both in France and England, being termed 'palm-play' in the former, and 'hand-tennis' in the latter; its present name is derived from its being played usually by five on each side. The method of play is very simple: A good roomy court is requisite, bounded by a high wall at one end, and against this wall a ball is propelled by striking it with the open hand. The players arrange themselves either five against five, as is usually the case, or in fewer numbers, and begin the game by one member striking the ball against the wall, and causing it to rebound anywhere beyond the floor-score, which is about two yards from the wall; one of the opposite party then strikes the ball as it rebounds, and, if it does not touch the wall higher than three ft. from the ground, his stroke goes for nothing, and the opposite party score one. The ball may be struck either from a direct rebound before it reaches the ground, or after it has 'dapped' or hopped from the ground once. 15 is usually game.

FIX, v. *fĭks* [F. *fixe*—from L. *fixus*, fixed, fastened: It. *fisso*]: to attach firmly; to fasten; to direct steadily, as the attention; to make immovable; to settle; to appoint; to establish; to become firm or solid. Fix'ing, imp., in *photog.* (see below). Fixed, pp. *fĭkst*, stable; firm; intently directed; not volatile. Fix'edly, ad. *-ĕd-lĭ*. Fix'edness, n., also Fixity, n. *fĭks'ĭ-tĭ* [F. *fixité*]: coherence of parts; stability; firmness. In a fix, in a difficulty. Fixa'tion, n. *-ā'shŭn* [F.—L.]: the act of fixing; stability; in *photog.* (see Fixing). Fixture, n. *fĭks'tūr*, any permanent article of furniture; that which is permanently attached; in *law* (see below). Fixure n. *fĭk'shûr*, in *OE.*, stable state; firmness; position; pressure; Fixed air, carbonic acid gas or carbon dioxide (see Carbonic acid), so named by Dr. Black, the first to observe that the solid substance, carbonate of magnesia ($MgCO_3$), could, when heated, evolve carbonic acid gas (CO_2), proving that the latter was a *fixed air* while in union with the magnesia. Fixed alkalies, potash and soda, as distinguished from ammonia, which is a volatile alkali. Fixed bodies, in *chemistry*, those substances which remain fixed, and are not volatilized at moderately high temperatures. Fixed oils, those which do not readily dry, retaining their oily character; those which on the application of heat, do not volatilize without decomposition: see Oils. Fixed stars, the stars which retain their relative positions in the heavens, not moving as the planets do (see Stars).—Syn. of 'fix, v.'; to determine; arrange; prepare; adjust; place; implant; pierce; transfix.

FIXING, *fĭks'ĭng*, in Photography: removal from a picture of the unaltered sensitive material. When a picture has been obtained through the agency of light, by the exposure of a sensitive surface suitably prepared, and the subsequent development of the latent image, there remains in the deepest shadows of the picture a portion of the sensitive material unacted upon by light. The removal of this by an appropriate solvent is termed F., though the term *clearing* would perhaps be preferable, F. being more strictly accurate in the case of the Daguerreotype (q.v.) process, where the picture is literally *fixed* to the silver-plate by the deposition of a film of metallic gold, of extreme tenuity, from a boiling hot solution of Sel d'or (q.v.). For particulars of failures arising from imperfect fixation or clearing, see Photography.

FIXTURES, in Law: primarily, a chattel or article of a personal nature affixed to, or permanently used in connection with, land or premises. Originally, F. were articles which could not be removed from land, but at the present day F. may be defined as articles which, having been annexed to land or premises, may be afterward severed and removed by the party who has annexed them, or by his personal representatives against the will of the owner of the freehold. (Tyler, *Fixtures*, 35.) Thus, it is seen that F. in the law denotes in general the reverse of the name. Under the English common law, every thing affixed to the freehold became a part thereof and was subjected to the law governing the freehold. The growth of trade and commerce, and the increasing importance of personal property made it necessary to relax this strict rule. Exceptions were gradually made in favor of erections put up by tenants or for manufacturing, trading, and agricultural purposes. Finally, domestic furniture, decorations, and ornaments were permitted to be removed. In respect to the method of annexetion, it may be said, that in order to make articles, originally personal, a part of the land or premises, and thus prevent their removal, they must either be fastened to the realty or to what is clearly a part of it, or must be placed upon the land with the manifest intent that they shall permanently remain there, and should be in some way peculiarly fitted to something that is actually fastened upon it if not absolutely necessary to its profitable use. (Tyler, *Fixtures*, 60.) As determining the right of removal, are to be considered: The nature of the thing affixed; the situation of the party claiming to exercise the right; whether as tenant, heir, vendee, mortgagee, etc.; the intention in making the annexation, the effect of custom, and the probable injury to be suffered by the removal. The fundamental point, however, is the intent with which the fixture has been erected, for, as a general rule, if the purpose was merely to benefit the land in general, the F. will become a part of the land, but if put up for trade, agriculture, or for the personal convenience of the party, it may be removed. Such cases must, however, be distinguished from the wrongful annexation to land by mere strangers, to whom no right of removal is given. In relation to the time when fixtures should be removed, as between landlord and tenant, the tenant is required to exercise his privilege during his term, unless a different agreement has been made by the parties.

FIZZ, v. *fĭz* [a word imitative of the sound]: to make a hissing sound. FIZ'ZING, imp. FIZZED, pp. *fĭzd.* FIZZLE, v. *fĭz'l*, to make a hissing sound; to fizz; to fail of success. FIZZLING, imp. *fĭz'lĭng.* FIZZLED, pp. *fĭz'ld.*

FJORD: see FIORD.

FLABBY, a. *flăb'bĭ* [imitative of the sound produced by the *flapping* of a loose broad surface, which is represented by the syllables *flab*, *flap*, *flag*, *flack*, and suchlike: Dut. *flabberen*, to flap, to flutter: prov. F. *flappe*, faded, soft]: unnaturally soft; hanging loose by its own weight. FLAB'BILY, ad. *-lĭ.* FLAB'BINESS, n.

FLABELLATE, a. *flă-bĕl'lāt*, or FLABEL'LIFORM, a. *-lĭ-fawrm* [L. *flabellum*, a fan; *forma*, shape]: in *bot.*, shaped, and sometimes plaited, like a fan.

FLABELLUM, n. *fla-bĕl'ŭm* [L. a small fan or fly-flap]: in *eccles. and chh. hist.*, an ecclesiastical fan, formed in Rome of peacocks' feathers, and, in other Obediences, of metal; anciently used to drive away flies and other insects from the chalice during the Sacred Mysteries. The Greeks and Armenians are the only Christians who make use of the flabellum: PLU. two fans of peacocks' feathers, borne before the Pope on solemn festivals; in *zool. and paleon.*, genus of actinozoa, family *Turbinolidæ.* It has existed from Eocene times till now.

FLACCID, a. *flăk'sĭd* [OF. *flaccide,* weak—from L. *flaccĭdus;* It. *flaccido,* flabby: F. *flaque;* Bret. *flak,* weak, drooping: Ger. *flacken,* to flicker (see FLABBY)]: not stiff; soft and weak; wanting in stiffness. FLAC'CIDLY, ad. *-lĭ.* FLACCID'ITY, n. *-sĭd'ĭ-tĭ,* or FLAC'CIDNESS, n. want of firmness or stiffness.

FLACCUS, *flăk'ŭs,* C. VALERIUS: Roman poet, of the 1st c.: supposed to have died 88. Absolutely nothing is known regarding his life. He is the author of an epic poem on the Argonautic expedition, which in its extant form is incomplete. Some modern critics, Wagner among others, praise it extravagantly, and place the author next to Virgil; but the more general opinion of sound scholars is, that the work is a specimen rather of learned mediocrity than of genuine inspiration. The *editio princeps* of the *Argonautica* appeared 1472. Of modern editions, may be mentioned those of Wagner (Gött. 1805) and Lemaire (Paris 1824). An English metrical translation was published by one Nicholas Whyte as early as 1565. Similar translations exist in French, Italian, and German.

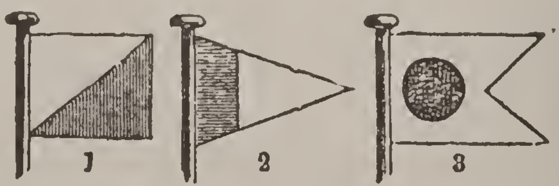
FLACIUS, *flā'shĭ-ŭs,* MATTHIAS: 1520, Mar. 21—1575, Mar. 11; b. Albona, Venetian Illyria: Lutheran theologian. He was dissuaded from becoming a monk, went to Bâle to study theology and Luther's writings 1539, taught privately at Tübingen 1540, removed to Wittenberg 1541, became prof. of Hebrew in the univ. there 1544, was forced to leave the city by the Schmalcald war 1547, resided some time in Magdeburg, and held a professorship in the Univ. of Jena, from which he was dismissed for opposing the state restrictions on the church 1561. He wrote the *Magdeburg Centuries; The Catalogus testium Veritatis* (1556); the *Missa Latina* (1557); the *Clavis Scripturæ Sacræ* (1567); and *Glossa on the New Testament.*

FLACOURTIACEÆ, *fla-kōrt-ĭ-ā'sē-ē:* natural order of exogenous plants, allied to Passion-flowers, consisting of shrubs and small trees, almost exclusively confined to the warmest parts of the globe. Many of the species, particularly of the genus *Flacourtia,* produce pleasant, sweet, or subacid fruits. *Flacourtia inermis* is much esteemed and cultivated in the Moluccas. Arnotto (q.v.) is produced by a tree of this order.

FLAG, n. *flăg* [Dan. *flag;* Dut. *vlag;* Ger. *flagge,* a flag: Dut. *flaggeren,* to flag, to hang loose; F. *flaque;* Bret. *flak,* flaggy, drooping: prov. Sw. *flage,* to flutter in the wind, as clothes (see FLABBY)]: a piece of cloth, white or in colors, on which may be wrought some device, usually set upon a staff to wave in the wind; the ensign or colors of a regiment, ship, etc. (see below): V. to hang loose and flabby; to grow spiritless or dejected; to lose vigor; to droop. FLAG'GING, imp.: ADJ. languishing; having a tendency to weariness or faintness. FLAGGED. pp. *flăgd.* FLAGGY, a.

flăg'gĭ, weak; not stiff. Flag'gingly, ad. *-lĭ.* Flag'giness, n. want of tension. Flag-captain, in the *navy,* the captain of the admiral's ship in any squadron, and ordinarily his nominee. Flag-feather, feather of a bird's wing next to the body. Flag-lieutenant, in the *navy,* officer who performs such duties for an admiral as would devolve upon an aide-de-camp in the army: he communicates the admiral's orders to the various ships, either personally or by signal. Flag-officer, in the *navy,* an admiral, vice-admiral, or rear-admiral. He is so called from his right to carry, at the mast-head of the ship in which he sails, a flag denoting his rank. For an admiral, the flag is borne at the main; for a vice-admiral, at the fore; and for a rear-admiral, at the mizzen: see Admiral. Flag-ship, the ship in a fleet which bears the flag of the superior officer, as the admiral, and therefore forms a sort of centre to which all other vessels must look for orders; usually the largest vessel in the fleet. Flag-staff, the pole or staff on which the flag is fastened. Black flag, flag of a dark color displayed to intimate to an enemy that no mercy will be given; the pirate's flag. Flag of truce, white flag displayed to an enemy to invite to a conference, or to make some request or communication not hostile. Red flag, flag of a red color displayed as a signal of danger, or as a token of defiance. National flag, flag of a particular country, on which some national emblem or device is emblazoned; representing the dominion and power of the nation (see Flag, below). To hang the flag half-mast high, to raise a flag only half-way up the mast or flag-staff as a token or sign of mourning. To strike or lower the flag, to lower it from the top in token of respect, or of surrender to an enemy.

FLAG: a cloth of light material, white or in colors, to be hung high or carried, designed to make known to spectators some fact or event. The F., in the army, is the ensign carried as its distinguishing mark by each regiment; also a small banner, with which the ground to be occupied is marked out. In the *navy,* the F. is of more importance, often constituting the only means vessels have of communicating with each other, or with the shore. For this purpose, devices of conspicuous colors (usually black, white, red, yellow, or blue) are hoisted at the mast-head or at the gaff. The flags having three forms—viz.,

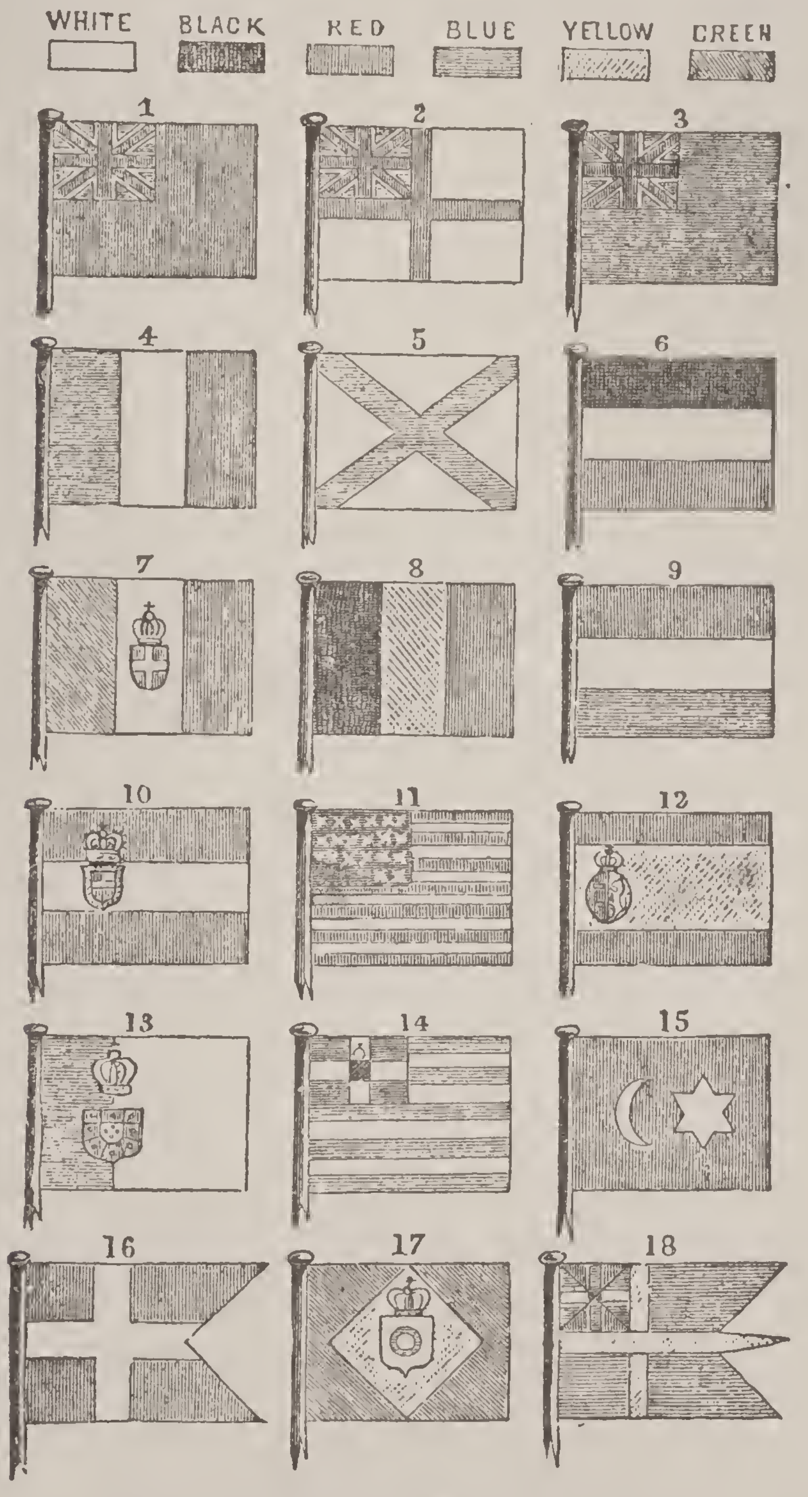


1, the Square Flag; 2, the Pennant; 3, the Burgee;

a very few patterns in each shape give sufficient combinations of three or four flags to express any letter or word in the language. The F. is also a sign of the rank of the principal person on board a vessel; as, on British ships, the

'Royal Standard,' containing the arms of the United Kingdom, hoisted only when a member of the royal family is on board; the Anchor of Hope, on a red ground, denoting the Admiralty. The pennant specifies the ship of war; and the ensign denotes the nation.

The ensigns borne by ships-of-war of the leading states of the world are as shown below (in these diagrams, the direction of the lines shows the color as in heraldry), viz.:



Flags of the Principal Maritime Nations:

1, Britain, red ensign; 2, Britain, white ensign; 3, Britain, blue ensign; 4, France; 5, Russia; 6, Germany; 7, Italy; 8, Belgium; 9, Holland; 10, Austro-Hungary; 11, United States; 12, Spain; 13, Portugal; 14, Greece; 15, Turkey; 16, Denmark; 17, Brazil; 18, Sweden.

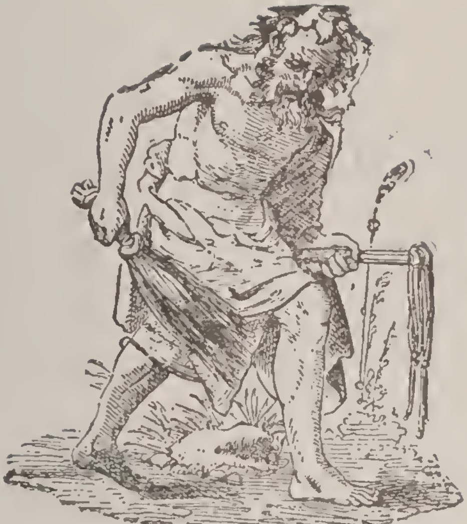
A white F. is accepted throughout the world as a token of peace; a red F., as defiance; and a black F. denotes a pirate; a F. of plain yellow usually signifies that the vessel bearing it is in quarantine. See UNION JACK.

FLAG, n. *flăg* [Dan. *flæg*, a marsh-plant; *flagre*, to wave to and fro as flame]: popular name for many endogenous plants with large-bladed or sword-shaped leaves, growing mostly in moist situations. It is sometimes particularly appropriated to the species of *Iris* (q.v.), or Flower-de-luce; but is given also very indiscriminately to other plants of similar foliage, as the *Acorus calamus* (see ACORUS), called Sweet Flag.

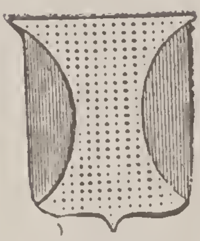
FLAG, n. *flăg* [Sw. *flaga*, a crack or breach; prov. Dan. *flag*, a turf peeled off from the surface: Icel. *flaga*, to cut turfs; *flis*, a splinter]: a broad flat stone used for pavements: V. to lay with broad flat stones. FLAGGING, imp. *flăg'gĭng:* N. the act of laying with broad flat stones; a side walk of large flat stones. FLAGSTONE, n. a rock which splits into tabular masses, or flags of various size and thickness, in the original planes of stratification. Flagstones are generally sandstones, combined with more or less argillaceous or calcareous matter; some, however, are indurated clays, and others thin-bedded limestones. They are used for paving, cisterns, etc. FLAG'GY, a. *-gĭ*, arranged in thin layers as a stone; capable of being split into flagstones.

FLAGELLANTS, *flăj'ĕl ants:* certain bodies of fanatical enthusiasts, who, at intervals from the 13th to the 16th c., made their appearance in different countries of Europe, proclaiming the wrath of God against the corruption of the times, inviting sinners to atone for sin by self-inflicted scourgings or flagellations, and themselves publicly enforcing this exhortation by voluntary scourging of themselves, and by other forms of self-castigation. In large and disorderly bands—frequently headed by priests, and by fanatics in the costume of priests and monks, bearing banners and crucifixes aloft, their breast and shoulders bare, and their faces concealed by a hood or mask, each armed with a heavy knotted scourge, loaded with lead or iron—they marched from town to town, chanting hymns full of denunciations of vengeance and of woe. In the most public place of each town which they entered, they threw themselves upon the earth, with their arms extended in the form of a cross, and there inflicted upon themselves the discipline of scourging, frequently to blood, and even to mutilation. Each member enrolled himself for 33 days, in honor of the 33 years of the life of our Lord on earth; and all for the time professed entire poverty, subsisting only on alms or voluntary offerings. These fanatical movements, the religious revivals of those days darkened by ignorance and superstition, recurred at frequent intervals. The most remarkable, however, are three in number. The first originated at Perugia 1260, when society in Italy was greatly disorganized by the long continued struggles of the Guelph and Ghibelline factions. The very disorders of the time prepared the way for this religious reaction. Numbers crowded to follow the new cry, until at last the body be-

PLATE 4.

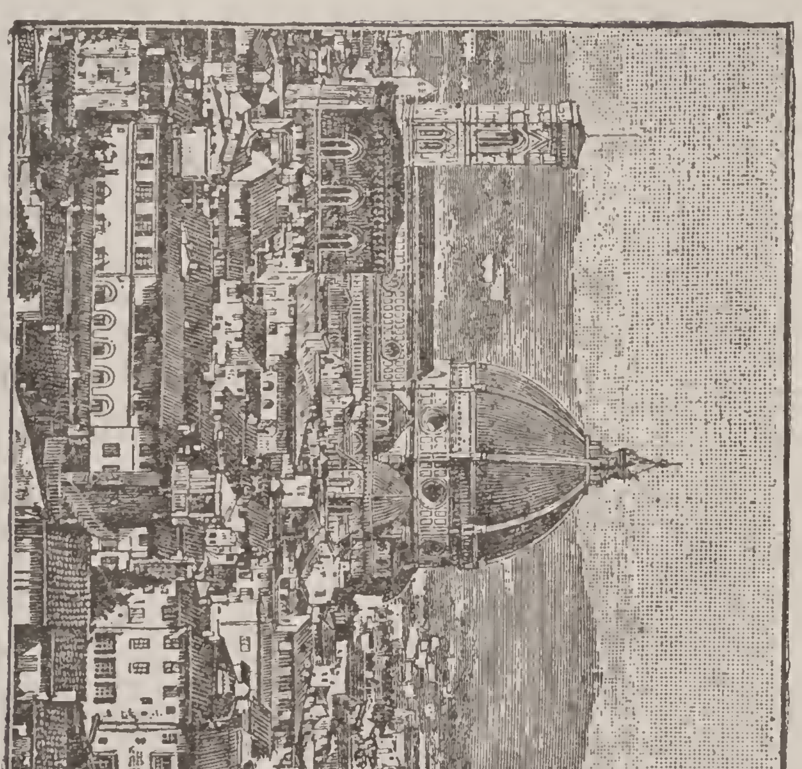


Flagellant.—From Amman's *Habitus Rom. Ecclesiæ.*



Flanches.

Flora.



Florence—the Cathedral and the Palazzo Vecchio—from the Palazzo Pitti.

came so formidable as to draw upon itself the suspicions of Manfred, son of Frederic II., by whom it was vigorously suppressed. Later offshoots of the party made their appearance in Bavaria, Austria, Moravia, Bohemia, Poland, and France; when to their extravagant practices, they added still greater extravagances of doctrine. In virtue of a pretended revelation, they asserted that the blood shed in self-flagellation had a share with the blood of our Lord in atoning for sin; they mutually confessed and absolved each other, and declared their voluntary penances to be a substitute for all the sacraments of the church, and for all the ministrations of the clergy. The Jews were to them an object of special abhorence; and this unfortunate race, exposed at all times to every caprice of the popular will, suffered dreadfully from the fury of the F. in many of the towns of Germany and the Netherlands. In the second outbreak of Flagellantism about 1349, the outrages against public decency were much more flagrant than at its first appearance. Men and women indiscriminately now appeared in public half naked, and ostentatiously underwent these self-inflicted scourgings. The immediate occasion of this new outburst of fanaticism, was the terror which pervaded society during the dreadful plague known as the Black Death, which Hecker, in his *Epidemics of the Middle Ages,* describes with terrible fidelity. The same extravagances were repeated in Upper Germany, the provinces of the Rhine, the Netherlands, Switzerland, Sweden, and even England. Although rigorously excluded from France, these fanatics effected an entrance into Avignon, then the residence of the popes, when they were condemned by a bull of Clement VI. The mania gradually subsided, nor is any permanent trace of it seen till the beginning of the next century. In 1414, a new troop of F., locally called *Flegler,* made their appearance in Thuringia and Lower Saxony, renewing and even exaggerating the wildest extravagances of their predecessors. These new fanatics appear to have rejected all the received religious usages, and indeed all external worship, placing their entire reliance on faith and 'flagellation.' Their leader was called Conrad Schmidt. They rejected not only the doctrines of the church on the sacraments, but also purgatory and prayers for the dead. Schmidt pretended a divine mission; and proclaimed that the blood of flagellation was the true wedding-garment of the gospel; that it was more precious than the blood of the martyrs, and a sure passport to eternal life. The violence of these fanatics drew upon them the severest punishments of the Inquisition. Many were capitally condemned, and Schmidt himself was burned at Sangerhausen 1414. Their doctrines, comprised in 50 articles, were condemned in the Council of Constance.

These strange extravagances are reprobated by the Rom. Cath. Church in common with all other Christian communities; but Rom. Catholics (relying on I. Cor. ix. 27; Coloss. iii. 5) hold the lawfulness, and even the meritorious character, of voluntary self-chastisement, if undertaken with due dispositions, practiced without ostentation or fanaticism, and animated by a lively faith and a firm hope in the merits of Christ. This is the self-castigation known under the name of 'the Discipline'—a form of mortification not unfrequent in the monastic state, and even practiced by lay persons, and these sometimes of the highest rank, both in ancient and in modern times. Compare Förstemann's *Die Christlichen Geisslergesellschaften*, Wadding's *Annales Minorum Fratrum*, Raynaldi's *Continuation of Baronius*, Mosheim's *Church History* (Soames' ed.), Gieseler's *Kirchengeschichte*, and Milman's *Latin Christianity*.

FLAGELLARIA, n. *flăj ĕl-lăr′ĭ-a* [L. *flagellum*, in allusion to the long, flexible branches]: in. *bot.*, genus of *Commelynaceæ*, or, according to some botanists, of *Juncaceæ*. The leaves of *F. indica* are said to be astringent and vulnerary.

FLAGELLATA, n. *flă-jĕl-lā′ta* [L. *flagellum*]: in *zool.*, an order of infusoria furnished with flagella, which are often accompanied by cilia. Both are used as organs of locomotion.

FLAGELLATE, v. *flăj′ĕl-lāt* [L. *flăgĕllātus*, flogged, scourged: It. *flagellare:* F *flageller*]: to whip; to scourge. Adj. having a long lash-like appendage. Flag′ellating, imp. Flag′ellated, pp. Flag′ella′tion, n. *-lā′shŭn* [F.—L.]: a flogging. Flag′ellant, n. [F.—L.]: one who flogs himself (see below.) Flagelliform, a. *flă-jĕl′lĭ-fawrm* [L. *flagellum*, a whip; *forma*, shape]: in *bot.*, flexible, narrow, and tapering, like the thong of a whip. Flagel′lum, n. *-lŭm* [L.]: in *bot.*, a weak, creeping stem, bearing rooting buds at different points, as in the strawberry (see Scape); the lash-like appendage exhibited by many infusoria; the divided limb of each of the antennæ of an insect.

FLAGEOLET, n. *flăj′ŏ-lĕt* [F. *flageolet*—from OF. *flagoler*, to pipe: Prov. *flageol*. a pipe]: wind instrument with a mouth-piece like that of the common whistle. It is of boxwood or ivory, in several pieces, and has holes for the fingers, like the flute. According to Burney, the flageolet was invented by Sieur Juvigny 1580. Flageolet-tones, the harmonic notes of the violin, violoncello, and other stringed instruments, which notes are produced by the finger lightly touching the string on the exact part which generates the harmony, and not by pressing the string down to the finger-board. The string vibrates on both sides of the finger, the long side dividing itself into parts of the same length as the short side: see Harmonics. The inventor of the manner of playing flageolet-tones is said to have been Domenico Ferrari. The best work on the subject is by Collinet.

FLAGITIOUS, a. *flă-jĭsh′ŭs* [L. *flagĭtĭōsŭs*, disgraceful—from *flagĭtō*, I demand hotly or fiercely: It. *flagizioso*]: grossly wicked; heinous; atrocious; villainous. Flagi′tiously, ad. *-lĭ*. Flagi′tiousness, n. wickedness; villainy.—Syn. of 'flagitious:' flagrant; corrupt; profligate; abandoned; shameful; scandalous.

FLAG OF THE PROPH′ET (Sanjak-Sherif): the sacred banner of the Mohammedans; originally white, composed of the turban of the Koreish, captured by Mohammed. A black flag was, however, soon substituted in its place, consisting of the curtain that hung before the door of Ayeshah, one of the prophet's wives. This flag, regarded by the Mohammedans as their most sacred relic, first came into the possession of the followers of Omar at Damascus; it afterward fell into the hands of the Abbasi; then passed into those of the caliphs of Bagdad and Kahira; and, at a later period, was brought into Europe by Amurath III. It was covered with 42 wrappings of silk, deposited in a costly casket, and preserved in a chapel in the interior of the seraglio, where it is guarded by several emirs, with constant prayers. The banner unfolded at the commencement of a war, and likewise carefully preserved, is not the same, though it is commonly believed by the people to be so.

FLAGON, n. *flăg'ŏn* [F. *flacon*, a great leathern bottle—from mid. L. *flascōnem*]: a large drinking-vessel with a narrow mouth.

FLAGRANT, a. *flā'grănt* [F. *flagrant*—from L. *flāgrăntĕm*, burning with heat: It. *flagrante*—*lit.*, burning or glowing with heat]: ardent; glaring; notorious; very great. FLA'GRANTLY, ad. *-lĭ*. FLA'GRANCE, n. *-grăns*, or FLA'GRANCY, n. *-sĭ*, excess; enormity. FLAGRANTE BELLO, *flā-grăn'tē bĕllō* [L.]: with the war raging at the time. FLAGRAN'TE DELIC'TO, *-dē-lĭk'tō* [L.]: in *law*, in the very act of committing a crime.—SYN. of 'flagrant'—see 'flagitious.'

FLAHAULT DE LA BILLARDERIE, *flâ-ō' dĕh lâ bē-yâr-drē'*, AUGUSTE CHARLES JOSEPH, Comte DE: 1785, Apr. 20—1870; b. Paris: soldier and diplomatist. He was destined for the army by his father, a general officer; and when a mere lad, he crossed the Alps as a volunteer in a cavalry regiment with Napoleon. He was rapidly promoted to the rank of aide-de-camp of Napoleon. He distinguished himself in the Peninsular war and the Russian campaign; and, 1813, received the title of Count, and the rank of gen. of division in the new army. On the return of Napoleon from Elba, he was one of those who recommended him to abdicate in favor of his son. He became an exile after Waterloo; and while in England, married a Scotch heiress, Lady Keith, a British peeress in her own right. His name was afterward removed from the list of exiles. After the revolution of 1830, F. returned to France, and was restored to his rank in the army. He entered the household of the king, and was ambassador to Vienna, 1842–48. After the establishment of the second empire, F. was called to the senate; and 1860–62 was French ambassador to London. In 1864, he was named grand chancellor of the Legion of Honor. His daughter married the fourth Marquis of Lansdowne.

FLAIL, n. *flāl* [OF. *flael;* Ger. *flegel;* F. *flayau* and *fléau*, a flail, a scourge (see FLOG)]: a wooden instrument for beating out corn from the ear, consisting of two heavy rods tied loosely end on end.

FLAKE, n. *flāk* [Sw. *flaga*, a crack, a flaw: Bohem. *flak*, a good piece: Icel. *flak*, a plank, a slice—*lit.*, a piece stripped off]. a feathery piece of snow as it falls from the clouds; a thin feathery plate; any scaly matter in small layers; a rude flint instr. in the form of a splinter or small layer; a variety of the carnation having its colors distributed in flakes—the *Dĭănthus căryŏphyl'lus.* V. to form into flakes; to peel or scale off. Fla'king, imp. Flaked, pp. *flākt.* Fla'ky, a. *-kĭ,* consisting of flakes. Fla'kiness, n. Flake-white, oxide of bismuth occurring in small flakes; pure white-lead.

FLAM, n. *flăm* [Ger. *flammern,* to glitter, to sparkle]: a story without foundation, invented to deceive or amuse; a falsehood; flattery for a purpose; blarney: see Flim-flam.

FLAMANT: in *her.,* flaming, burning, blazing; as a torch, a firebrand, etc.

FLAMBEAU, n. *flăm'bō* [F.—from L. *flamma,* a flame]: a lighted torch. Flam'beaux, n. plu. *flăm'bōz* or *-bō.*

FLAMBOROUGH HEAD, *flăm'bŭr-rō hĕd* (Saxon, *Fleamburgh*): promontory of the Yorkshire coast, England, and forming the n. boundary of Bridlington Bay. It terminates a range of white perpendicular chalk cliffs, 6 m. long, 300 to 450 ft. high. Its rugged sides contain many caverns, and in the sea near are many picturesque chalk rocks, which swarm with sea-birds. The chalk contains fossil sponges, crinoids, etc. On the Head is a lighthouse, 214 ft. high, visible 19 m. away. Across the peninsula, ending in the head, runs a ditch with two lines of defense and breast-works, called Dane's Dyke, but really ancient British work.

FLAMBOYANT, *flăm-boy'ant:* latest style of Gothic architecture which prevailed in France. Its date there was the 15th and part of the 16th c., and corresponds to

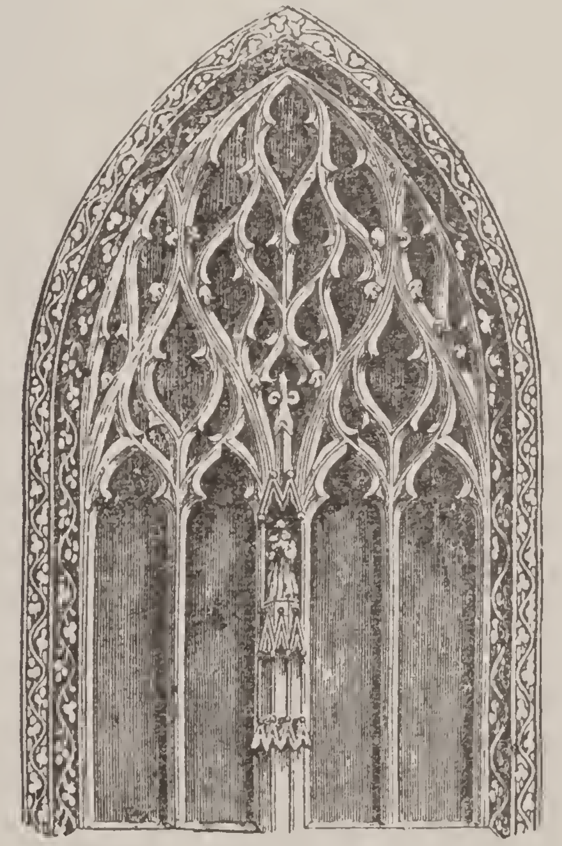


Fig. 1.—Window, Harfleur.

the Perpendicular (q.v.) in England. The name is derived from the flame-like forms of the tracery of the windows, panels, etc. (fig. 1). The characteristics of this style are minute and elaborate ornament, combined with general bareness of surface. The crockets, for instance, are generally cut into a great number of small leaves, while they are placed far apart; the moldings are divided into large empty hollows, and small thin fillets and beads; the finials have crockets minutely carved, set upon bare pyramidal terminals; the arch-moldings are divided into a great number of small parts, and lack the boldness and decision of the earlier styles. These moldings are frequently abutted on the pillars, or continued down them without any caps; and when there are caps, they are small and without effect. See fig. 2. When moldings join, they are frequently run through one another, so as to appear to interlace. The effect is intricate rather than beautiful, suggestive, like the rest of the style, of ingenuity in stone-cutting rather than of art. The doorways and windows are sometimes large and fine (as in fig. 1); but while these are highly enriched, the general surface of the building is left too plain. There are many large buildings in France in this style, but usually portions only are fine, while the general effect is deficient. Some of the spires of this period are very beautiful: the n. spire of Chartres Cathedral, for example, is considered one of the finest in France.

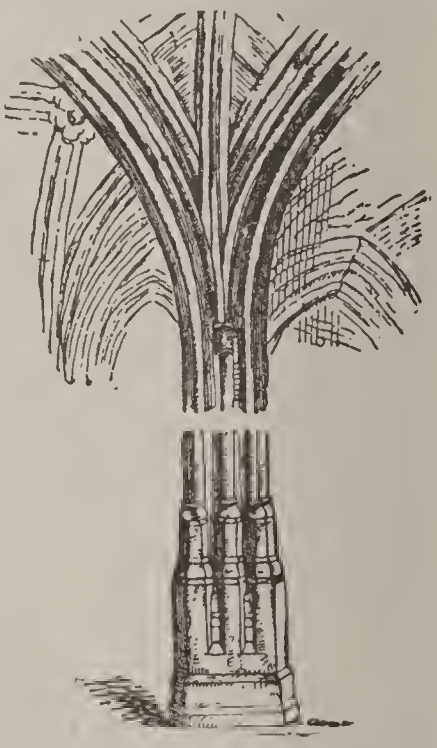


Fig. 2.

FLAME, n. *flăm* [F. *flamme,* a flame, a streamer; *flamber*, to blaze—from L. *flamma,* a flame]: a blaze; fire in general; combustion of gas or vapor (see below): heat of passion; warmth of affection; love; violence; one beloved: V. to blaze; to burn as a gas; to break out into violence; in *OE.*, to inflame; to animate. FLA'MING, imp.: ADJ. blazing; bright; luminous; captivating; attractive: N. a bursting out into flame. FLAMED, pp. *flămd.* FLAME'LESS, a. destitute of flame. IN A FLAME, intensely excited; thoroughly roused for action. FLAME-BRIDGE, wall rising from the floor of a furnace to cause the flame to impinge upon the bottom of the boiler. FLAME-COLORED, of a bright yellow color. FLAME-ENGINE, early name for the gas-engine, in which the piston is moved by the expansion due to the sudden combustion of a body of gas in the cylinder. FLAME-LILY, in *bot.*, the amyrillidaceous genus *Pyrolirion.* FLAME-MOTH, *Anticlea rubidata.* FLAME-TREE, in *bot.*, *Brachychiton acerifolium.* FLA'MINGLY, ad. *-lĭ.*

FLAMY, a. *-mĭ*, blazing; having the nature of flames. **FLAMEN**, n. *flā'mĕn* [akin to Gr. *phlego*, I set on fire]: the person who lights the sacrificial fires; a priest of anc. Rome, dedicated to the service of a particular divinity, and called by a distinctive name. There were 15 flamens in all: the chief (*Flamines Majores*) were the flamens of Jupiter, of Mars, and of Quirinus, who were always patricians; the remaining 12 (*Flamines Minores*) were chosen from the plebeians. The flamens were elected at first by the *Comitia Curiata*, but afterward by the *Comitia Tributa*, and were installed into their office by the supreme dignitary of the Roman pagan religion, the *Pontifex Maximus*. The flamen of Jupiter was a privileged person; he was not required to take an oath, was attended by a lictor, his house was an asylum, and he had a seat in the senate. But all this was attended by numerous superstitious restrictions: he might not have a knot on any part of his attire, nor touch flour, or leaven, or leavened bread; he might not touch or name a dog, or mount a horse, or be a night out of the city, etc. His wife, called Flaminica, was subjected to similar restrictions, and when she died, the flamen was obliged to resign. The majority of Roman writers attribute the institution of flamens to Numa. *Note.*—A *flamen* is said by anc. L. authors to be so named from a *fīlum* or fillet of wool worn around the head or cap.—SYN. of 'flame, n.': (see FIRE); blaze; brightness; ardor; fervency; excitement; lover; sweetheart.

FLAME: particular form of combustion (q.v.) or burning. Ordinary combustion consists in the oxygen of the atmosphere combining with some combustible substance so rapidly as to give out light and heat. When the combustible is either originally a gas, or becomes so by the heat, the combustion takes the form of flame. F., then, is the burning of a gas. In most cases, the gas of F. is a compound of hydrogen and carbon, with minute particles of solid carbon suspended in it, and is formed from the fuel (coal, tallow, etc.) being decomposed by the heat. The heat and light of F. vary with the gas: hydrogen produces great heat, but little light. The lighting power of a gas depends upon the proportion of carbon that it contains, the particles of which become glowing hot before being consumed.

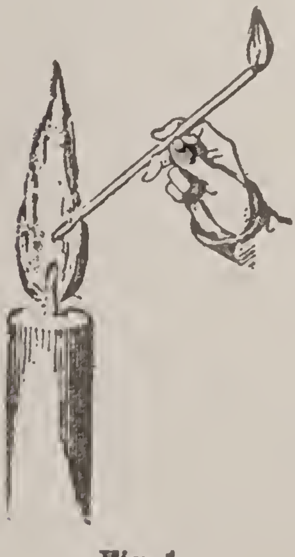


Fig. 1.

The F. of a lamp or candle, or simple gas-jet, consists of a hollow cone, in the centre of which there is no combustion. The central space appears dark only by contrast with the luminous cone which surrounds it. It consists, in reality, of transparent invisible compounds of carbon and hydrogen constantly rising in vapor from the wick. If a glass tube, open at both ends, be held obliquely in the F. of a candle, with its lower extremity in the dark central space above the wick, it will conduct away a portion of the combustible vapor, which may be kindled like a gas-jet at its upper end, as represented in fig. 1. This dark portion of the F. may be called *the area of no combustion.* The luminous cone which envelops the dark space is *the area of partial combustion.* The oxygen of the atmosphere penetrates to this depth, but not in sufficient quantity to oxidize or burn both the carbon and the hydrogen; it therefore unites with the hydrogen, for which it has the stronger attraction, and leaves the carbon free. The outer cone is named *the area of complete combustion,* because there the carbon meets with sufficient oxygen to burn it entirely. The light is produced in the area of partial combustion; there the carbon is set free from the hydrogen in the form of solid particles, and is heated to whiteness by the combustion of the hydrogen. The combustion of the carbon in the outer cone, by which it is converted into carbonic acid gas, produces heat, but so little light as to be barely traceable.

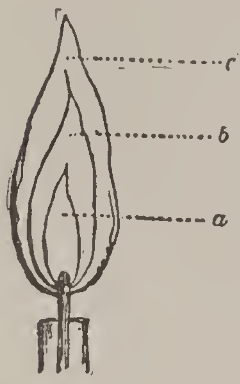


Fig. 2.
a, area of no combustion; *b*, area of partial combustion; *c*, area of complete combustion.

That carbon exists in a solid state in the white part of an F., is readily shown by holding a piece of white earthen-ware in it, which becomes coated with carbon in the form of soot. No soot is deposited in the dark or no-combustion area of the F., because there the carbon is in chemical combination with hydrogen, forming a gas. The carbon becomes solid only when the hydrogen deserts it to unite with oxygen. The high illuminating power of compounds of hydrogen and carbon is thus traced to the fact, that *their hydrogen and carbon do not burn simultaneously, but successively, and in such a way that the one heats the other white hot.* It is quite possible to make them burn simultaneously; but when they do, the light evolved is very feeble. This takes place in the 'Bunsen burner,' in which air is allowed to mix with the gas before combustion.

FLAMINGO, n. *flă-mĭng'gō* [Sp. *flamenco,* a flamingo—from Sp. *flama;* L. *flamma,* a flame], (*Phœnicopterus*): genus of birds which until recently was placed by all naturalists among the *Grallatores* (Waders), but is now generally ranked among the *Palmipedes,* and even referred to the family of *Anatidæ.* The bill is large, deeper than broad, and suddenly curved downward near the middle, so that, as the bird wades and seeks its food, either in the water or in the mud, it makes use of the bill in a reversed position, the upper mandible being lowest. The edges of both mandibles are furnished with small and very fine transverse laminæ, which serve, like those in the bills of the ordinary *Anatidæ,* to prevent the escape of the small crustaceans, mollusks, worms, small fishes, seeds, etc., which are the F.'s food, and to separate them from the mud with which they may be mingled. The upper surface of the tongue is also furnished on both sides and at the base with numerous small flexible horny spines, directed backward. Unlike the ordinary *Anatidæ*, flamingoes ha great part of the tibia, as well as the tarsus, naked, in this resembling all the Waders. They are birds of powerful wing, and fly either in strings or in wedge-shaped flocks like geese, a single bird leading the way for the flock. They seldom make use of their webbed feet for swimming, to which the length of their legs is not well adapted, the use of the membrane being rather to support them on soft muddy bottoms. When feeding, they keep their feet in almost constant motion, as if to stir the mud. Hundreds may sometimes be seen feeding together in the shallow waters or salt marshes of tropical coasts, chiefly of Asia and Africa, or on the banks of rivers or inland lakes, and by their large size and rich colors making a brilliant spectacle. They make their nests in marshes, scraping together a heap of mud, on the top of which is the nest; and it is said that the long legs of the female F. often hang down into the water during the incubation, not being easily disposed of otherwise.—There are several species of F., but very similar to each other, in appearance and habits. One species only visits the south of Europe, the Common F. (*P. ruber*), a bird measuring fully four ft. from the tip of the bill to that of the tail, and six ft. from the tip of the bill to the claws; the male, when in full plumage, is of a rose-red color, with deep purple wings; the female, and the young for several years, are less brilliant, the young at first being whitish, and the red appearing first on the wings.—The American F. (*P. Americanus* or *Chilensis*) is of a more orange tint, and is abundant on many parts both of the e. and w. coasts of America.

Flamingo (*Phœnicopterus ruber*).

FLAMINIAN WAY, *fla-mĭn'ĭ-an wā* (*Via Flaminia*): the great northern road of anc. Italy, leading from Rome to Ariminum (*Rimini*) on the Adriatic. It was constructed by C. Flaminius during his censorship (B.C. 220), and was designed to secure a free communication with the recently conquered Gaulish territory. The F. W. was one of the most celebrated and most frequented roads of Italy during the period both of the Republic and of the Empire. Its importance may be estimated from the fact, that when Augustus (B.C. 27) appointed persons of consular dignity road-surveyors for the other highways of his dominions, he reserved the care of the F. W. for himself, and renewed it throughout its whole length. Its general direction was northerly. Leaving Rome, it kept for the most part at no great distance from the Tiber till it reached Narnia (*Narni*), where it struck off n.e., passing Interamna (*Terni*) and Spoletium (*Spoleto*), and reaching the foot of the Apennines, at Forum Flaminii. Crossing the central ridge of the Apennines, at Ad Ensem (La Schieggia?), it again proceeded in a northerly direction, pursuing much the same line of route as the modern road from Foligno to Fano, and reached the Adriatic at Fanum Fortunæ (Fano), whence it wound along the coast to Ariminum (Rimini), where it ended, or rather where the name ceased; for the Via Æmilia (see EMILIAN PROVINCES) was a continuation of it. The whole length of the road from Rome to Ariminum was (according to the Jerusalem Itinerary), 222 m., and according to the Antonine, 210 m. Remains of it at various points assist the antiquary in tracing its direction.

FLAMINIUS, *fla-mĭn'ĭ-ŭs,* CAIUS: d. B.C. 217: Roman general of plebeian birth. He was chosen tribune B.C. 232, procured the passage of an agrarian law which was violently opposed by the Optimates, became pretor 227; and soon afterward consul, and, though he achieved a great triumph over the Insubrian Gauls 223, was removed from his office by the senate. In 220 he became a censor and constructed the celebrated circus and highway from Rome to Ariminum on the Adriatic, to which his name was given. This great road, by some accounts 222 m. long, and by others 210 m., was built both for military and for commercial purposes, and secured direct communication with the recently conquered territory of Gaul. In B.C. 217 he was again chosen consul, and, without waiting for the prescribed public and religious ceremonies that followed election, hastened to Arretium to engage in an aggressive campaign against Hannibal. The latter, however, had crossed the Apennines and was marching toward Rome before F. was aware of his intentions. F. then started in pursuit, penetrated the narrow defile formed by the Cortona hills near Lake Thrasymene, during a thick haze, and was there surprised by Hannibal, who had made a stand on the hills. The Roman army, completely surrounded, fought valiantly for 3 hours, and lost 15,000 killed, including Flaminius, June 23.

FLAMINIUS, *fla-mĭn'ĭ-ŭs,* TITUS QUINCTIUS. abt. B.C. 228–174: Roman general. He began his public career as a tribune under Marcellus, became questor B.C. 199, and consul 198, and immediately went to Macedonia to conduc the war against King Philip, who had obtained advantage over previous Roman commanders. In his first engagement he defeated the Macedonians with great loss, and made himself master of Epirus. By his military prowess and his just and liberal administration, he won the adhesion and support of the various Grecian states, and on the expiration of his year as consul was continued in command of the great army by special vote of the senate. All his attempts to negotiate peace having failed, he resumed the campaign against Philip early in B.C. 197, and after as kirmish between the cavalry near Pheræ, both armies met at

Cynoscephalæ, in Thessaly. At first the right of the Macedonian army led by Philip in person pressed so hard against the Roman left that it gave way and began a confused retreat. F., ignoring this disaster, charged the Macedonian left while it was forming on the hills, and before the officers could form the lines, the Romans fell upon the enemy, and a frightful slaughter ensued. While F. was operating against the Macedonian left, another part of his army attacked the Macedonian right as it was pursuing the Roman left, and turned the defeat on the hills into a general rout. A panic seized the whole Macedonian army, the superiority of the Roman legion over the Macedonian phalanx was demonstrated; and the losses of the day amounted to 8,000 killed and 5,000 prisoners on the Macedonian side, and only 700 in all on the Roman. Philip surrendered all his Greek towns in Europe and Asia, paid a heavy indemnity to the Romans, and was allowed to retain his Macedonian kingdom almost intact. In the following year, at a great assembly of Greeks at the Isthmian games, F., proclaimed liberty and independence to all the Greek states which had been subdued by Macedon. In 195 he overthrew the tyrant Nabis in Sparta, spent some time in restoring peace and prosperity to Greece, and in 194 returned to Rome and was honored with a three days' triumph. During 192–190 he was diplomatic representative of Rome in Greece, in 189 became censor, 183 undertook an embassy to Prusias, King of Bithynia, to induce him to surrender Hannibal, who was an exile there, and was frustrated in his designs by the suicide of the famous Carthagenian general. F.'s latter days were peaceful and happy.

FLAMMARION, *flâ-mâ-rē-ōng'*, CAMILLE: French astronomer: b. Montigny-le-Roi, Haute-Marne, 1842, Feb. 25. He was intended by his family for the priesthood, and studied first in the seminary at Langres and then in Paris. In 1858 he changed his purpose and entering the imperial observatory, studied astronomy there till 1862, when he succeeded Abbé Moigno as editor of *Cosmos.* In 1865, he became scientific editor of the *Siècle,* and began delivering popular lectures on astronomical subjects, and in 1868 made a number of balloon ascensions to study the atmosphere at great altitudes. He is an active member of numerous scientific societies, has become noted by his lectures on Spiritualism; and has published *La Pluralité des Mondes Habités* (1862); *Les Mondes Imaginaires et les Mondes Réels* (1864); *Les Merveilles Célestes* (1865); *Dieu dans la Nature* (1866); *Histoire du Ciel* (1867); *Contemplations Scientifiques* (1868); *Voyages Aériens* (1868); *L'Atmosphère* (1871); and *Vie de Copernic* (1873).

FLAMSTEED, *flăm'stēd*, JOHN: 1646, Aug. 19—1719; b. near Derby, England: first astronomer-royal of England, for whose use the Royal Observatory at Greenwich (called Flamsteed House) was built. He early applied himself to mathematical and astronomical pursuits. While yet a youth he mastered the theory of the calculation of eclipses; and his calculations of some remarkable eclipses of the moon called to him the attention of Sir Jonas Moore, then surveyor-gen. of the ordnance, through whom, and in connection with whose dept., he was appointed astronomer to the king 1675. The year following, the observatory at Greenwich was built, and F. began that series of observations that constitute the commencement of modern practical astronomy. He formed the first trustworthy catalogue of the fixed stars, and furnished those lunar observations on which Newton depended for the verification of his lunar theory. Extracts from the papers of F., found in the observatory by Francis Baily, and published by authority of the admiralty 1835, brought to light a sharp quarrel between F. and Newton and Halley with regard to the publication of the results of F.'s labors. The *Historia Cœlestis Britannica*, his great work, in three vols., giving an account of the methods and results of astronomical observations up to his time, of which the printing began before his death, was not published till 1725. While following his scientific pursuits, F. qualified himself for holy orders, and at the age of 38 years, was presented to the living of Burslow, in Surrey, which he held till his death.

FLAN, v. *flăn* [etym. doubtful]: in *arch.*, to splay or bevel internally, as a window-pane. Flanning, n. internal flare of a window jamb, or of a fireplace; an embrasure; coving.

FLANCHES, *flănch'ez,* or Flanques, *flănks,* in Heraldry: an ordinary composed of arched lines drawn from the upper angles of the escutcheon to the base points; the arches of the flanches almost meet in the center of the shield.

FLANCONNADE, *flăng-kŏn-ād'* . a thrust in fencing (q.v.).

FLANDERS, *flăn'dėrz:* formerly the name of an extensive and almost independent territory ruled by "counts," and embracing, besides the present Belgian provinces of of the same name, the s. portion of the province of Zealand in Holland, and some of the departments in the n.e. of France. Cæsar found this district inhabited by the Morini, the Menapii, and the Nervii, and, having conquered these tribes, he annexed the country. Under the rule of the Franks, the river Scheldt, which flowed through the district, formed the boundary line between Neustria and Austrastia, in consequence of which the n. and s.w. part of the territory comprised under the term F., though its population was decidedly Germanic, came to belong to France, while the s.e., though to a large extent non-Germanic, was after 1007 included in the German Empire. F. obtained its name from the *Vländergau* (*pagus Flandrensis*, the district around Bruges and Sluis), whose counts had been made wardens of the n.e. coasts of France at the period of the incursions of the Normans, in the latter half of the 9th c., and who extended the name of their hereditary possessions to the whole district which they governed. The first count or markgraf of the country is said to have been Baldwin, surnamed *Bras de Fer* (Iron Arm), who married Judith, daughter of King Charles the Bald of France, and widow of Ethelwulf king of England, and afterward received the newly created 'mark' or county (864) as a hereditary fief from his father-in-law. He extended his territories by the addition of Artoivs; which was held by his successors until Philippe Auguste reunited it to France. He died 879, but not until he had inaugurated the industrial greatness of F. by introducing into it a great number of workmen skilled in the manufacture of woolen and other goods. Baldwin IV., or the Bearded, one of the successors of Baldwin *Bras de Fer*, received in fief from Emperor Henry II., the burgraviate of Ghent, Walcheren, and the islands of Zealand, and thus became a prince of the German Empire. He was succeeded by his son Baldwin V., or the Pious (1036–67), who increased his possessions by the addition of the German territory between the Scheldt and the Dender, belonging to the duchy of Lower Lorraine. To this he added Tournay, the supremacy over the bishopric of Cambray (to which, till the erection of the new bishopric of Arras, the county of Flanders had been ecclesiastically subordinate), and the county of Hainault. During the middle ages, F. figured prominently in the political affairs of Europe—the counts of F. being more powerful and wealthy than many European kings. Baldwin IX., founder of the Latin kingdom at Constantinople, died 1206, leaving two daughters, one of whom died without children; the other bequeathed Hainault to John of Avennes, her son by her first marriage; and F. to Guy Dampierre, her son by a second marriage. Meanwhile, the industrial prosperity of the cities of F. had become so great that the citizens began to feel their own power, and to claim independence. They formed republican communities like the free cities of Germany, with this difference, that they admitted the nominal suzerainty of the counts. But they were not afraid to take up arms in defense of their liberties against their nominal masters. Witness the insurrection headed by Jakob van Artevelde (q.v.) against the cruel government of Count Louis I. On the marriage of Marguerite, daughter and heiress of Louis II., Count of Flanders, to Philip the Bold of Burgundy, the country was united to the Burgundian territories in 1384, and afterward shared the fortunes of that duchy. The dukes of Burgundy brought great part of the former duchy of Lower Lorraine under their dominion, and thus laid the foundation for the subsequent union of the states of the Netherlands, in which F. continued to form one main component part. On the death of Charles the Bold, these territories passed, 1477, to the House of Hapsburg, by the marriage of his daughter Mary to the archduke Maximilian. After Burgundy had passed with King Philip II. to the Spanish line of the House of Hapsburg, the territory of F. was considerably diminished, as not only was the portion called Dutch Flanders transferred to the Estates-general by the peace of Westphalia, but, in the time of Louis XIV., France seized upon another portion of F., as also part of Hainault, Cambray, and Artois, and was confirmed in her possession by the peace of Aix-la-Chapelle, of Nimeguen, and of Utrecht. By the last, and by the treaty of peace concluded at Rastadt, the remains of the Spanish Netherlands again fell into the hands of the House of Austria. In 1794, F., like the other provinces of Belgium, was incorporated with the French Republic, and afterward with the Empire, and formed the depts. of Lys and Escaut; the Congress of Vienna, however, conferred these positions on the new kingdom of the Netherlands, with which they remained united till the formation of the kingdom of Belgium (q.v.). The Belgian portion of F. is now divided into the provinces of E. and W. Flanders (q.v.).—Compare Praet, *Histoire des Comtes de Flandres, et de l'Origine des Communes Flamandes* (Brussels 1828); Le Glay, *Histoire des Comtes de Flandres jusqu' à l'Avènement des Ducs de Bourgogne* (2 vols. Paris 1843); Kervyn van Lettenhoven, *Histoire de Flandres* (3d ed. 5 vols. Bruges 1874–5), etc.

FLAN'DERS, East: province in the n.w. of Belgium, bounded on the e. by the provinces of Antwerp and Brabant, on the s. by Hainault, on the w. by West Flanders, and on the n. by the Dutch province of Zealand: 1,160 sq. m. East F., having abt. 768 inhabitants to a sq. m., is the most populous province of the most populous country in Europe: see Belgium. It is watered mainly by the Scheldt, and by its affluents the Lys and the Dender. The surface is low and level. The soil has been rendered extremely fertile by spade cultivation and an excellent manuring system. Besides the ordinary varieties of grain, potatoes, flax, hemp, and hops are produced in great quantity. The district in the n.e. of the province, between the towns of Antwerp and Ghent, is celebrated as a flax-growing quarter. The manufactures are chiefly lace, damasks, linens, woolens, bobbinet, silk, and cordage; sugar-refining, brewing, and distilling are also carried on. Chief towns: Ghent, Alost. and Dendermonde. Pop. of province (1880) 881,816; (1890) 958,752; (1900) 1,029,971.

FLAN'DERS, West: most w. province of Belgium; bounded on the n. by the North Sea, and on the w. and s. by France; 1,250 sq. m. Its chief rivers are the Lys and the Iser; but it is watered by numerous smaller streams, and is intersected by many important canals. Its surface is flat, with sandy hills in the s. and along the coast; and its soils sandy, but well cultivated and productive. It has fewer products and manufactures than E Flanders. Chief towns. Bruges. Courtrai, and Ostend. Pop. of province (1880) 691,674; (1890) 746,923; (1900) 805,236.

FLANDRIANS, n. *flăn'drĭ-anz* [named from the country of Flanders, in which the sect flourished]: subdivision of the Mennonite Anabaptist sect: see ANABAPTISTS.

FLANEUR, n. *fla-nėr'* [F.—from *flâner*, to lounge or saunter about]: a lounger.

FLANG, n. *flăng:* a miner's two-pointed pick.

FLANGE, n. *flănj* [Ger. *flantsche*, a slice: F. *flanchère*, a flanker, a side piece]: a raised or projecting rim of anything, as of a railway-wheel, or a pipe: its use is to serve as a bearing, or as a means of fixing and holding in place. FLANGED, a. *flănjd*, having a flange, or connected by a flange.

FLANK, n. *flăngk* [F. *flanc:* Ger. *flanke:* It. *fianco*, the flank of a body]: the fleshy or muscular part of an animal situated between the ribs and the hip; the side of anything, as of an army—the flanks of an army being its wings or bodies of men on its extreme right or left, prepared to close in on an enemy attacking the centre; the extreme right or left of a military position; the part of a fortification placed to defend another (see FORTIFICATION): V. to attack the side or flank of an army; to pass round the side or flank; to border; to touch; to be posted on the side. In evolutions, 'to flank' is to take such a position with troops as either to aid one's own army in an attack on the enemy, by leading the latter to suppose that his flanks are in danger in his present position, or to prevent him from advancing on one's comrades by threatening his flanks if he should do so. FLANK'ING, imp. attacking on the side; commanding on the flank. FLANKING-PARTY, body of horse or foot, hanging upon and harassing the flank of an enemy's force. FLANKED, pp. *flăngkt*, covered or commanded on the flank. FLANK'ER, n. he or that which flanks. FLANK FILES, the soldiers marching on the extreme right and left of a company or any other body of troops. FLANK COMPANY, the company on the right or left when a battalion is in line; the grenadier and light infantry companies usually occupy these positions, and are known as flank companies, whether with the remainder of the regiment or not. FLANK MOVEMENT, the posting of troops so as to be able to attack the extreme right or left of an enemy. FLANKS OF A FRONTIER, certain salient points in a national boundary, strong by nature and art, and ordinarily projecting somewhat beyond the general line: their effect is to protect the whole frontier against an enemy, as he dare not penetrate between them, with the risk of their garrisons, reinforced from their own territories, attacking his rear, and cutting off communication between him and his base. Silistria and Widin were flanks of the Turkish frontier during Omar Pasha's campaign 1853, 54. TURN THE FLANK, to attack a body of troops on the side. TO OUTFLANK, to extend beyond the extreme right or left of an enemy; succeeding by maneuvers in commanding the flank of an enemy who has been, on his part, endeavoring to flank one's own force. INNER FLANK, the part nearest the point on which a line rests, or the part farthest from the enemy.

FLANKS, n. *flăngks* [etym. doubtful]: a wrench or any other injury in the back of a horse.

FLANNEL, n. *flăn'nĕl* [F. *flannelle,* flannel: W. *gwlanen,* flannel—from *gwlan,* wool: Sp. *flanéla*—formerly written FLANNEN]: soft woolen cloth, loose in texture. FLAN'-NELED, a. *-nĕld,* covered or wrapped in flannel.—*Flannel* differs from broadcloth and most other woolen fabrics in being woven of yarn more loosely twisted, and having less dressing. Welsh flannel from the wool of the Welsh mountain-sheep, has highest reputation. Large quantities of English flannel are made in W. Lancashire, W. Yorkshire, and the neighborhood of Leeds. A more closely spun and woven flannel, used for cricketing and rowing shirts, etc., and dyed and printed with various colors and patterns, is made in the west of England cloth-making district, in the vicinity of Stroud, in Gloucestershire. Fine light flannel of this kind is made in France and Belgium; some of this is twilled, and approaches nearly in quality to French merinoes, but is much softer. The demand for this sort of fancy-shirting flannel has of late become considerable, and has led to the production of many varieties, which, though bearing the name of flannel, vary so materially from the original Welsh flannel, that they can scarcely be included with them under any general definition. Coarse flannel, called *Galways,* is made in Ireland, and is chiefly used by the peasantry of the country.—In the United States, the flannel manufacture is prosperous, and some of the product is of the highest grade.

FLAP, n. *flăp* [representing the sound of a blow with a flat surface: Dut. *flabbe,* a slap, a fly-flap: Low Ger. *flabbe,* a hanging lip]: anything broad, hanging loose, and easily moved; the motion and noise of it, as sails against the mast; one of the pieces loosely covering the outside pockets of a coat: V. to move, as wings; to move or fall, as something loose; to beat with a flap. FLAP'PING, imp.: ADJ. moving something broad and loose; beating. FLAPPED, pp. *flăpt:* ADJ. struck with something broad; let down. FLAP'PER, n. he or that which flaps. FLAP-EARED, having broad loose ears. FLAP-JACK, a sort of broad pancake. FLAP-MOUTHED, having loose hanging lips. FLAP-DRAGON, a small edible taken out of a dish containing spirits in flame, and immediately swallowed; a fanciful or unnatural viand of a similar kind; snap-dragon: V. to gulp down or swallow a fanciful or unnatural viand.

FLARE, v. *flār* [Dan. *flagre;* Ger. *flackern*, to flicker, to flutter: Norw. *flara*, to blaze, to flame: L. *flagrārĕ*, to blaze, to flame (see FLAGRANT)]: to burn or glitter with a splendid but transient show; to show an unsteady light; to spread outward: N. a broad unsteady light, offensive to the eye. FLA'RING, imp.: ADJ. burning with a wavering light; showy. FLARED, pp. *flārd*. FLA'RINGLY, ad. *-lĭ*. TO FLARE UP, to rouse up suddenly to anger; to make an unexpected show of temper.

FLASH, n. *flăsh* [representation of the sound made by a dash of water or by a sudden burst of flame: Swiss, *flatschen*, to splash; *flatzgen*, to blaze: Icel. *flasa*, to burn violently: comp. Gael. *flaiche*, a sudden burst, as wind or sunshine]: a sudden but transitory burst of light or flame; a sudden burst, as of wit; a short transient state: V. to burst or open instantly on the sight; to strike or throw, as a burst of light; in *OE.*, to dash or splash among water: ADJ. in *slang*, denoting that which is spurious, deceptive, or roguish. FLASH'ING, imp.: ADJ. bursting forth, as a flood of flame: N. act of blazing; a sudden and momentary burst, as of light; in *glass-making*, the expansion of an open glass vessel produced by revolving it at nearly a melting heat. FLASHED, pp. *flăsht*. FLASH'Y, a. *-ĭ*, showy, but empty; gay. FLASH'ILY, ad. *-lĭ*. FLASH'INESS, n. the state of being showy but unsubstantial. FLASH'INGS, n. plu. pieces of lead or zinc, or other metal, used to cover joinings on roofs, also called *aprons* in Scotland. FLASH-LANGUAGE, the language spoken by thieves. A FLASH IN THE PAN, a sudden failure of any enterprise.—SYN. of 'flash, v.': to glitter; glisten; glister; flare; glare; flicker.

FLASK, n. *flăsk* [Ger. *flasche;* Sw. *flaska;* OF. *flasque*, a flask, a bottle (see FLAGON)]: a kind of bottle for containing liquors or powder. FLASKET, n. *flăsk'ĕt*, a long shallow basket.

FLAT, a. *flăt* [imitative of the dashing down of something soft: F. *flac*, a clap by something soft: Dut. *vlecke*, a blot, as of ink: Dut. *vlack;* Ger. *flach*, flat, close to the ground: Icel. *flatr*, flat]: smooth; even; level; tasteless; insipid; depressed; prostrate; unanimated; positive or downright; in *music*, out of tune, by not vibrating quite quick enough: N. a level or extended plain; a shoal or shallow; an even surface; the broad side of a blade; a story or floor of a house; a sign in music (♭) which lowers the following note half a tone; at the beginning of a piece of music, it denotes that all the notes on its line or space, with their octaves above and below, are to be played flat; in *slang*, any one easily deceived or taken in. FLAT'TISH, a. somewhat flat. FLAT'LY, ad. *-lĭ*, evenly; positively. FLAT'NESS, n. state or quality of being flat; deadness; dulness; insipidity; dejection of fortune or mind. FLAT'TED, a. rendered even on the surface; made flat; wanting in life or spirit. FLATTEN, v. *flăt'n*, to make flat; to become flat. FLAT-

TENING, imp. *flăt'nĭng.* FLATTENED, pp. *flăt'nd.* FLATWISE, ad. with the flat downward; not on the edge. FLATLONG, ad. *flăt'lŏng,* in *OE.*, with the flat part downward.

FLATBUSH, *flăt'bûsh:* village of Kings co., N. Y., adjoining the city of Brooklyn and connected with its ferry system by numerous street railroads. It contains the co. almshouse, hospital, lunatic asylum, and nursery, has 5 churches and Erasmus Hall Acad.; was the scene of the battle of Long Island 1776, Aug. 27; and is a favorite place of residence of New York and Brooklyn business men. (See LONG ISLAND, BATTLE OF.) It became a part of Greater New York, 1898, Jan. 1.

FLAT'-FISH: popular name of the fishes of the family *Pleuronectidæ* (q.v.), as the flounder, plaice, sole, turbot, halibut, etc.; which have the body much compressed, and the sides unsymmetrical, swimming on one side. It is sometimes extended in its signification to include skates and other fishes of the Ray (q.v.) family, which are very different, being cartilaginous fishes, quite symmetrical, and swimming on the belly, though, like the *Pleuronectidæ,* generally keeping close to the bottom. It is never applied to the much compressed symmetrical fishes, such as the dory, which swim in the ordinary posture of fishes, the dorsal edge, upward, the ventral downward.

FLATHEAD PASS: opening in the Gallatin range of the Rocky Mountains, 15 m. from Union Pass, in Montana. It is 6,769 ft. above sea level, and has long been a thoroughfare for the Flathead, Shoshone, and Bannock Indians.

FLATHEADS, *flăt'hĕdz:* name given to various tribes of American Indians because of their practice of flattening the heads of their infants by mechanical compression. The chief tribes which both flatten the top of the head and indent the forehead are the Chinooks, Calapuyas, Clickitats, Clatsops, Cowalitsk, and Clatstani. The practice at one time prevailed also among the Chickasaws, Choctaws Natchez, Caribs, Toltecs, ancient Peruvians, and others; but has now become nearly obsolete, the fish-eating Chinook group on the Pacific coast being almost the only Indians that so disfigure the heads of their infants. The name has long been incorrectly applied to the Selish tribe, also named Hopilpo by Lewis and Clarke, who visited their reservation on the Bitter Root or St. Mary's river in Or., 1806–7. These do not flatten the head at all and never have done so. The remnant of the Selish tribe was removed from the Or. reservation to one in the Jocko Valley, Mont, 1871.

FLATHER, JOHN JOSEPH: an American engineer; b. 1862, June 9; was graduated at the Sheffield Scientific School, Yale University, 1885; professor of mechanical engineering at Purdue University, 1891-98. In the latter year he became professor of the same subject. Univ. of Minnesota. He wrote *Treatise on Steam Boilers; Dynamometers and the Measurement of Power,* etc.

FLATIDÆ, n. *flā'tĭ-dē* [L. *flata*—from *flo,* I blow]: in *entom.*, family of homopterous insects, akin to *Cicadidæ,* but having their wings covered with a white farinaceous powder and so much resembling those of some moths that they have been called Moth Cicadas. They furnish a secretion called Chinese wax, which when removed is renewed. Flata is the typical genus of the family.

FLATTER, v. *flăt'tėr* [F. *flatter;* OF. *flater,* to pat, to caress: Icel. *fladra,* to wag the tail as a dog, to flatter: Ger. *flattern,* to flutter: Dut. *fletteren,* to flatter]: to praise falsely; to gratify another's self-love by praise; to soothe with praise; to raise false hopes in. Flat'tering, imp.: Adj. pleasing to pride or vanity; gratifying to self-love; encouraging hope. Flat'tered, pp. *-tėrd,* soothed by praise; pleased by commendation. Flat'terer, n. one who flatters. Flat'teringly, ad. *-lĭ.* Flat'tery, n. *-tėr-ĭ,* false praise; that which gratifies self-love; obsequiousness.—Syn. of 'flattery': adulation; compliment; praise.

FLATTERY, Cape, *flăt'ėr-ĭ:* headland of Washington Territory, on the Pacific coast of the United States: see Cape Flattery.—Another headland of the same name is on the e. coast of Australia, lat. 14° 52′ s., and long. 145° 20 e.; about 30 m. n. of Endeavor Bay.

FLATULENT, a. *flăt'ū-lĕnt* [mid. L. *flatŭlen'tus,* flatulent—from L. *flātŭs,* a breath, a breeze: F. *flatulent,* flatulent]: windy; affected with air in the stomach and bowels; vain; empty. Flat'ulently, ad. *-lĭ.* Flat'ulence, n. *-lĕns,* or Flat'ulency, n. *-lĕn-sĭ,* distention of the stomach or bowels by the gases formed from food (see Indigestion). Flatus, n. *flā'tŭs* [L.]: wind collected in the intestines; disturbance caused by it; a puff of wind; a breath.

FLAUCHTER, n. *flawcht'ėr:* person employed in carding wool; man who cuts turf, by means of a flauchter-spade.

FLAUNT, v. *flawnt* [Bav. *flandern,* to wave to and fro: Ger. *fladdern,* to flutter: Gael. *flann,* red or gaudy]: to wave to and fro in the wind; to move about in fine clothes to let them be seen; to display ostentatiously and offensively, to carry a pert or saucy appearance: N. anything displayed for show. Flaunt'ing, imp.: Adj. making an ostentatious display. Flaunt'ed, pp. Flaunt'ingly, ad. *-lĭ.*

FLAUTIST, n. *flaw'tĭst* [It. *flauto,* a flute]: a player on the flute.

FLAVEDO, n. *flă-vē'dō* [L. *flavesco,* I become yellow]: disease in plants which alters their green into a yellow color.

FLAVEL, *flăv'ĕl,* John: abt. 1627–1691, June 26; b. Bromsgrove, Worcestershire: English non-conformist. He was educated at Oxford, appointed curate at Deptford, settled as rector at Dartmouth 1656, and expelled from his benefice for refusing to subscribe to the Act of Conformity 1662. Subsequently he preached privately as occasion offered till 1687, when a royal license to worship without molestation was granted and his followers built him a new church. His published works include *Husbandry Spiritualized* (1669); *A Saint Indeed* (1673); *Divine Conduct* (1678);

The Touchstone of Sincerity (1679); *Personal Reformation* (1691); *Remains* (1691); *Exposition of the Assembly's Catechism* (1692); *The Soul of Man* (1698); and *Methods of Grace* (1698).

FLAVERIA, n. *fla-vĕr'ĭ-a* [L. *flavus*, yellow, one of the species being used to dye that color]: in *bot.*, the typical genus of the composite sub-tribe *Flaverieæ*, a sub-tribe of *Senecionideæ*.

FLAVIAN, *flā'vĭ-an*, F. *flâ-vē-ăng'*, I., SAINT: abt. 309-404: patriarch of Antioch. He inherited great wealth, was a lay monk in early life, zealously applied his means and abilities to the church, and is credited with having devised the choir and introduced the responsive singing of the Psalter. In 381 he was chosen successor of Meletius as bp. of Antioch; in 387 prevented by his influence Theodosius the Great from punishing the seditious people of the city who had overthrown the statues of the emperor and empress, and throughout his administration opposed Arianism and the Mersulians.—There were two others of the same name, of whom one became patriarch of Antioch and one patriarch of Constantinople, and both after death were enrolled among the saints.

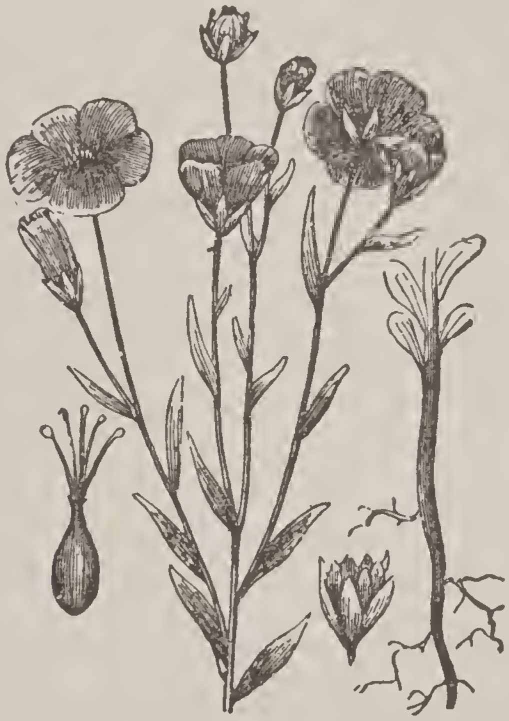
FLAVINE, or FLAVIN, *flā'vĭn:* yellow coloring matter employed in dyeing, and imported in the condition of extract. It is understood to be the coloring matter of quercitron bark, and is used in place of it. When treated with hot water, F. yields a yellow turbid solution, which, settling, deposits a yellow-brown powder. In dyeing with it, the cloth is first treated with an aluminous mordant (see CALICO); and on subsequent immersion in the solution of F., a fine yellow color is fixed on the cloth. The coloring power of the extract F. as imported is so great that one ounce is equal in dyeing qualities to one lb. of quercitron bark.

FLAVOR, n. *flā'vėr* [F. *flairer*, to smell, to scent; *fleurer*, to exhale an odor: OE. *flaware*, a strong smell]: peculiar taste or smell; quality of anything which affects the smell; odor; fragrance; taste: V. to impart a smell or taste to. FLA'VORLESS, a. destitute of flavor. FLA'VORING, imp. FLA'VORED, pp. *-vėrd:* ADJ. having a quality that affects the sense of smelling or tasting. *Note.*—Skeat says the primary meaning of FLAVOR is 'hue,' and that the etymon is mid. L. *flavor*, golden coin; then, 'a yellow or bright hue'—from L. *flavus*, yellow; but that the sense was modified by OF. *flairer*, to exhale an odor.

FLAW, n. *flaw* [Sw. *flaga*, a crack, a flaw: W. *fflaw*, a splinter; connected with FLAG and FLAKE]: a blemish; a crack; a defect; in *OE.*, a sudden gust; a violent blast of wind: V. to crack; in *OE.*, to render nugatory, or of no effect. FLAW'ING, imp. FLAWED, pp. *flawd.* FLAW'Y, a. *-ĭ*, having a blemish or defect. FLAW'LESS, a. without a blemish. FLAW-PIECE, slab from the outside of the log. —SYN. of 'flaw, n': defect; fault; imperfection; speck; spot; breach; gap; fissure.

FLAX, n. *flăks* [AS. *fleax*, flax; *feax*, the hair: Dut. *vlas;* Ger. *flachs*, flax: Bohem. *wlakno*, unspun flax, fibres]: a plant with small blue flowers—the *Līnŭm ūsĭtātĭs'sĭmum*, ord. *Linācĕæ;* the prepared fibres or threads of the same which are made into linen cloth. FLAX-DRESSER, one who prepares the fibres. FLAX'EN, a. *-ĕn*, made of or resembling flax; fair, or of the color of tow. FLAX'Y, a. *-ĭ*, composed of or resembling flax. FLAX-WEED, in *bot.*, *Linaria vulgaris*. FLAX-WORTS, name given by Lindley to the order *Linaceæ*.

FLAX (*Linum*): genus of plants comprising the greater part of the nat. ord. *Linaceæ;* an exogenous order allied to *Geraniaceæ* and *Oxalideæ*, consisting of annual and perennial herbaceous plants, with a few small shrubs. There are about 90 known species of this order scattered over the globe, but most abundant in Europe and n. Africa. Their leaves are simple, entire, without stipules, and generally alternate. The COMMON FLAX or LINT (*L. usitatissimum*) is by far the most valuable. It is a hardy herbaceous annual with beautiful blue flowers about an inch in diameter. In a wild state it is about 18 inches high, but grows much taller when cultivated. In a good soil, with room for full development, it throws out numerous branches each bearing many seeds, but if crowded, it sends up a single stalk, which blossoms at the top and ripens but few seeds. The stem is smooth and the leaves narrow and lanceolate. The flowers appear in loose panicles. Each part is in five divisions. The calyx has five sepals, the corolla five petals, and five stamens surround the pistil, which has five styles. The lower portion of the pistil becomes the boll, or seed-head. This, in its early stages, is composed of five cells; but before ripening, each cell is divided by a portion so that the mature



Common Flax (*Linum usitatissimum*).

boll is composed of ten cells, each containing a seed. The seeds are small, flat, very smooth, and covered with a mucilaginous substance soluble in hot water, and which under the name of 'flax seed tea' is largely used as a soothing drink in various diseases. The inner portion of the seed contains an oil (see LINSEED OIL), extensively used in painting, the manufacture of printer's ink, and for other industrial purposes. From 18 to 20 per cent. of oil can be obtained by hydraulic pressure, and from 22 to 30 per cent. by heat and pressure combined. The portion left after the oil is extracted is known as oil cake (see OIL CAKE) which is one of the richest feeding materials for cattle known. Large quantities are shipped to England where it finds ready sale. It is extensively used in this country also being pulverized and sold as oil-meal or linseed meal. The crushed seed and the meal both are used with good results for poultices on sores and inflamed surfaces. The stalk consists of three portions; the woody stem, which contains a pith; an inner bark which consists of long, tough fibres which adhere together and to the other portions of the plant with which they come in contact; and the outer bark. The inner bark is the only portion of the stalk which is of much value. It is separated from the other parts by soaking to dissolve the adhesive substance; breaking the woody stem into short pieces, and scutching, or whipping out the bits of bark and stalk. The fibres are then straightened by hatcheling (or hackling) ready for market. The long fibres are called 'dressed flax' and the short ones 'tow.' The fibres are very tough and strong, are excellent for weaving or spinning, are very white when bleached, and are easily dyed. They are used for a great variety of purposes, such as making cloth of fine and delicate qualities as well as the coarser and heavier grades; linen thread, both strong and pliable, and fine qualities of writing paper (see LINEN).

F. has been grown as a cultivated crop from the earliest historic times. From it was made the 'fine linen' mentioned in the book of Genesis, and the plant is referred to by name in various portions of the Old Testament and in other ancient writings. In warm countries linen cloth was early used for clothing as a substitute for the skins of animals which first were employed. The mummies of Egypt were wrapped in fabrics of linen, and for the many purposes for which cloth was required in early times linen was almost universally used. The ancient Hindoos, however, used the fibre of the cotton plant though they cultivated F. for its seed. In the time of Herodotus much linen was exported from Egypt and the extensive production of F. has continued until the present day. F. is now grown, either for seed or fibre, or both, in many lands, and aside from plants used for food is one of the most useful of cultivated plants.

The F. plant readily adapts itself to a great diversity of soils and climates, and can be successfully produced from the tropics almost to the extreme limit of vegetation in high latitudes. The finest quality of fibre is obtained in rather cool and moist regions. In n. latitudes the fibre is short and the seed, though abundant, is somewhat inferior to that grown in warmer climates. F. has long been cultivated in Great Britain, and at various times earnest efforts have been made by legislative enactments, offers of premiums, labors of individuals, and organization of societies, to enlarge the area devoted to its production but with little success. Vast quantities of fibre and seed are imported every year. In this country many efforts have been made to induce farmers to grow F. in larger quantities, but they have resulted in only temporary improvement. As early as 1629 an order was issued to introduce the cultivation of this crop into the Massachusetts colony and in 1657 bounties were offered for its production in Virginia. Since that time continually the demand has far exceeded the supply. Previous to the establishment of cotton and woolen mills, and the building of railroads, many farmers grew F. merely for home use, dressing it themselves—their wives and daughters spinning the fibres and weaving it into cloth, but in the progress of the age such occupations have been left far behind. In 1894–5 the importations of flax-seed and fibre into the United States, chiefly from the E. Indies, were as follows: fibre 7,233 tons, valued at $2,059,291; seed 4,166,223 bushels, valued at $4,554,485; of the fibre imported 2,225 tons were hackled, valued at $1,050,548; there were also 5,008 tons of flax and tow, valued at $1,008,743. In this country F. is grown almost exclusively for the seed. On account of the labor required to fit it for market only a very small proportion of the fibre is utilized. Most of the straw is either burned or used for manure. F. is grown mostly on comparatively new land. For subduing prairies and tough sod it is one of the best crops known. On this account, and because the seed can always be sold for cash, it is a favorite crop with pioneers. But it does not long retain its popularity, and the centre of production steadily moves westward with the advancing settlement of the country. The U. S. Census Bulletin for 1890 gave the production of flax in 1889 as follows: area 1,318,698 acres; seed 10,250,410 bushels; fibre 241,389 pounds; straw commercially utilized 207,757 tons; total value of all flax products $10,436,228. In 1902 the production of flax-seed aggregated 29,284,880 bushels, valued at $30,814,661. South Dakota produced 15,552,000 bushels, over one-half the total output

Soil, Cultivation, and Harvesting.—While F. can be grown on a great variety of soils it thrives best on a deep, dry loam. Wet land must be thoroughly underdrained, and clay land finely pulverized, before good crops can be produced. Light, thin soils give a small yield of seed and an inferior fibre. The land should be well enriched for the crop preceding F., and a dressing of ashes or commercial fertilizer may profitably be applied when the land is prepared to receive the seed. The application of unfermented stable manure at the time of sowing causes a coarse growth of straw, a light yield of seed, and tends to fill the land with weeds. As the roots of the plant are about half as long as the stalk deep plowing is essential. Heavy soils are to be plowed in the fall. Light cross-plowing in the spring is advantageous, and thorough pulverization of the surface is imperative. The land should then lie undisturbed about two weeks, in order that the weed seeds in the ground may sprout. Toward the last of April, if the ground is dry, another harrowing should be given to destroy weeds and fit the land to receive the seed. The best and ripest seed of the previous year's crop should be obtained for sowing, and it should be cleaned in the best possible manner to free it from the seeds of weeds and to remove the lighter seeds of the grain itself. This is important as old and inferior seed will not make good returns, and weeds are the worst enemies with which the crop has to contend. The Riga and the Dutch are the principal varieties. The former is the most prolific, while the latter yields a nicer fibre. If grown only for seed, from three pecks to a bushel per acre should be sown; but if for fibre, from 1½ to 3 bushels. If both seed and fibre are wanted, 1½ bushels per acre will suffice. If sown by hand the seed should be soaked in warm water about three hours and rolled in gypsum. As the seed is extremely smooth it is almost impossible to sow it evenly unless it is thus prepared. Broadcast machines, operated by hand, are often used. Great care should be taken in sowing, as the quantity of seed and quality of fibre produced will be greatly influenced by the manner in which the seed is distributed, The seed is often covered with a harrow, after which the ground is rolled, but many small cultivators do not allow a team on the field after it has been sown, but cover the seed with a small bush harrow drawn by hand. The only cultivation which F. receives is weeding which should be done when the plants are not more than three or four inches high. The weeds should be cut close to the ground as pulling them would uproot the F. The weeders should be barefooted, or wear socks instead of shoes, as the latter would injure the stems of the F. and cause defects in the fibre. Harvesting is done by pulling the plants by hand or cutting them close to the ground with a scythe or reaping machine. The proper time is when the bolls have turned brown and the leaves on the lower half of the stalk have withered, usually about Aug. 1. If harvested rather green the fibre will be of better quality, but less in quantity, than if gathered later, while if it becomes very ripe the quality of the seed is improved at the expense of the fibre. Various machines have been invented for pulling F., but have never become popular. The root ends of the stalk should be kept as even as possible. The stalks should be tied in small bundles and thoroughly dried before being put in a large stack or mow. Threshing can be rapidly done by whipping the seed end of the bundles over a large stone. Flails are often used, but they break the stalks and thus injure the fibre. When large quantities are to be shelled the heads are held against the cylinder of a threshing machine until the bolls are taken off. The bundles are not unbound and the straw is not run through the machine. If shelled by hand the seed should be carefully cleaned by the use of a winnowing mill. Good land should yield 10 to 15 bushels of seed and about two tons of straw.

Flax-dressing needs only a brief description, as but little fibre is prepared in this country and the slow and laborious methods formerly employed on the farm have been largely superseded. The straw is usually sold by the grower, and fibre is prepared by machinery at the linen mills. Under the old system the straw is subjected to the process of retting, or rotting. This dissolves the gum which causes the fibres to adhere together and to the stalk. There are two methods, dew-retting and water-retting. By the former, most frequent in this country, the stalks are spread thinly and evenly, in regular swaths, upon a smooth grass field. When partly retted they are carefully turned and allowed to remain until the process is completed. They are then raked into bundles, bound, and put under cover: from two to six weeks are required. Water-retting takes less time and gives more uniform results. A platform of boards or rails is made on the bottom of a pond or stream. Upon this the bundles are placed, with the roots down, and kept submerged by stones or timbers. When the stalk will break without bending and will slip from its covering, the bundles should be removed, spread, and dried. This process occupies from five to ten days. At linen mills, retting is hastened by the use of steam. Breaking, is next performed: it consists in breaking the woody stem into short pieces, called 'shives.' On a small scale it is done with a simple instrument, called a break, made of slats, but power-breaks with fluted rollers are needed where a large quantity is to be treated. Scutching is the final operation which frees the fibre from the wood and bark. The F. is held, a handful at a time, in the notch of an upright scutching board and struck with a thin wooden knife until the shives are removed. There are various machines for this purpose, those using brushes being considered the best. Hatcheling, or combing, is the last process in fitting the fibre for use: it consists in drawing the fibres through a comb with long, sharp, iron teeth which separate and straighten them. The F. is then ready to be packed for market (see LINEN MANUFACTURES).

FLAX, NEW ZEALAND: a valuable fibre quite different from common flax; obtained from the leaf of an endogenous, instead of the stem of an exogenous plant. The plant yielding it is *Phormium tenax*, often called New Zealand Flax, sometimes Flax Lily and Flax Bush; of the nat. ord. *Liliaceæ*, a perennial plant, native of New Zealand and Norfolk Island; its leaves resemble those of an Iris, are from two to six ft. long and one to two or three inches broad. The flowers are produced in a tall branched panicle; are numerous, brownish yellow, not beautiful; the fruit is a three-cornered capsule with numerous compressed jet-black seeds. The fibre of the leaves is very fine and very strong, and was used by the New Zealanders, before their country was discovered by Europeans, for making dresses, ropes, twine, mats, cloth, etc. N. Z. F. is exported for making twine and ropes; and the plant is cultivated in its native country, and its culture has been attempted in parts of Europe; but the winters except in the south, are too cold for it. To obtain the fibre, the leaves are cut when at their full size, and usually macerated for a few days in water. But the New Zealanders procure the fibre in its greatest perfection, very long and slender, shining like silk, by a more laborious process, and without maceration, removing the epidermis from the leaf when newly cut, separating the fibres by the thumb-nails, and then more perfectly by a comb.

New Zealand Flax (*Phormium tenax*).

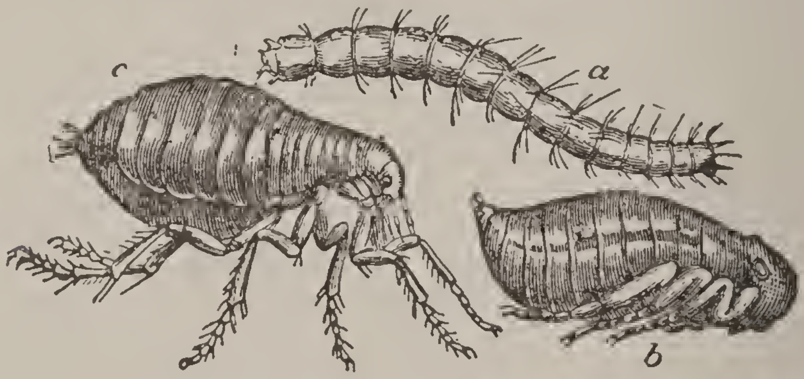
The roots are purgative, diuretic, sudorific, and expectorant; a good substitute for sarsaparilla.—The leaves, when cut near the root, exude a viscid juice, which becomes an edible gum.—The New Zealanders prepare a sweet beverage from the flowers.

FLAXMAN, *flăks'man*, JOHN: 1755, July 9—1826, Dec. 7; b. York: greatest of English sculptors. At the age of 15, he became a student in the Royal Acad., but never worked in the studio of any master. In 1782, he married Ann Denman, a woman of superior gifts and graces, who soon began to exercise a beneficial influence upon his studies. Accompanied by her, he went 1787 to Italy, where he attracted attention which increased after his return to London 1794. He was elected an associate of the Royal Acad. 1797; royal academician 1800; and, was appointed prof. of sculpture to that institution 1810. After the death of his wife 1820, he withdrew from society. F.'s most celebrated works are his *Outlines to Homer's Odyssey* (Rome 1793), and *The Iliad* (Lond. 1795), and his illustrations of Dante and Æschylus. Many of his works show wonderful grandeur of composition, and a pure and noble style. He was one of the first of those who, following the example of Winckelmann, strove to penetrate to the true spirit of antique art, in opposition to the false taste of the time. The study of vase-paintings, and of the Pompeian mural pictures, then just revived, led him to abandon the sickly mannerism of his predecessors for the severe simplicity of the antique, and he may be styled the author of modern *rilievo* (see ALTO-RILIEVO). His works are not all of equal value; and, in general, his skill in modelling was not equal to his inventive genius. The poetry of his conceptions is of high order. F. contributed much toward bringing the outline style, now so popular, into general use. Of his sculptures, the best known in England are his bas-relief monument to the poet Collins at Chichester, the monument to Lord Mansfield, and that to the Baring family at Micheldean Church, in Hampshire. His model for the shield of Achilles, from the 18th book of the *Iliad*, is particularly admirable. See Prof. Sidney Colvin's *Drawings of F., with an Introductory Essay on his Life and Genius* (London 1876).

FLAY, v. *flā* [Icel. *flaga*, to cut thin turfs: Dut. *vlaegen*, to flay]: to strip off the skin of an animal. FLAY'ING, imp. FLAYED, pp. *flād*. FLAY'ER, n. one who.

FLEA, n. *flē* [Ger. *floh;* Icel. *fló*, a flea]: small insect of dark-brown color, surprisingly nimble, and very troublesome by its bite. FLEA-BITE, red spot caused by the bite of a flea; slight wound or pain; a matter of little consequence. FLEA-BITTEN, bitten or stung by a flea; marked with spots as if flea-bitten. FLEA-WEED, in *bot.*, *Galium verum.* FLEA IN HIS EAR, sharp and disagreeable rebuff.

FLEA (*Pulex*): Linnæan genus of apterous insects, now commonly regarded by entomologists as constituting a distinct order, *Suctoria, Siphonaptera*, or *Aphaniptera*. The species are not numerous, and little subdivision of the genus has been attempted. It has been suggested as probable, that further investigation may lead to a recognition of the fleas as belonging to some of the larger orders, with parts modified to suit their parasitical life. All the species are very similar to the COMMON FLEA (*P. irritans*), which is plentiful in all parts of the world, living by sucking the blood of man, and of some species of quadrupeds and birds. It abounds particularly in the nests of poultry, pigeons, and swallows, and wherever sand and dust accumulate in the chinks of floors, etc., it is plentiful also in beds, wherever cleanliness is neglected. The abundance of fleas in some countries is an intolerable nuisance to travellers, and residents; notably in many parts of Australia, where the general dryness and warmth encourage their growth to an extent against which precautionary measures are almost unavailing. The female F. is rather larger than the male, but the sexes are otherwise very similar. The head is small, very compressed, rounded above, and has on each side a small round eye. The mouth has two lancet-like mandibles, the maxillæ being represented by two conical scales, the mandibles and maxillæ forming a suctorial beak, with a slender bristle-like tongue, the whole inclosed between two three-jointed plates. The thorax consists of three segments, the second and third of which bear a scale on each side; the scales are regarded as rudimentary wings. There is no marked division between the thorax and the abdomen, which consists of nine segments, much larger than those of the thorax, but much compressed. The whole body is covered with a tough integument. The activity of the F., its power of leaping, and its extraordinary strength, are well known. Its strength has sometimes been applied to drawing miniature carriages, cannon, etc., which the public have been invited to witness through a magnifying-glass, as an amusing spectacle. Fleas undergo a complete metamorphosis. The female lays about a dozen eggs of white color, and slightly viscous. The larva is a lively little worm, at first white, afterward reddish, and without feet. When about to change into a pupa, it incloses itself in a little silk cocoon, from which emerges the perfect flea. Cleanliness and careful attention are the principal means of keeping beds and houses free of fleas; but where these are found insufficient, as in some climates, and in cottages where there is much wood-work with gaping joints, certain strongly aromatic plants are employed, whose odors seem detestable to them, as the different *Compositæ* known by the name of fleabane, also wormwood, the merits of which last are thus extolled by Tusser:

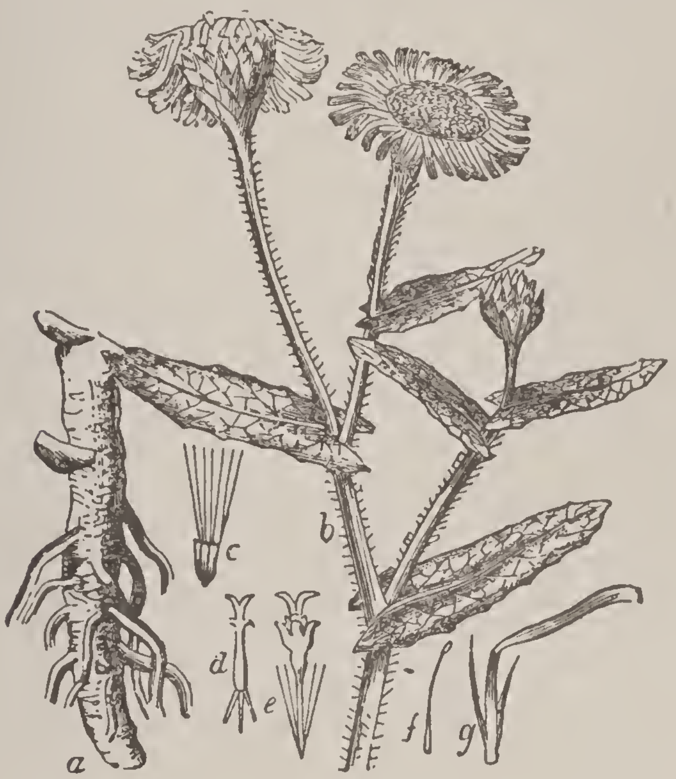


Metamorphoses of Common Flea (*Pulex irritans*), magnified: *a*, larva; *b*, pupa or nymph; *c*, perfect insect.

'While wormwood hath seed, get a handfull or twaine,
To save against March, to make flea to refraine;
Where chamber is sweeped, and wormwood is strown,
No flea for his life dare abide to be known.'

Other species of fleas infest particular animals, as the cat, dog, fox, mole, etc.—The Chigoe (q.v.), or Jigger of the W. Indies, nearly allied to the true fleas, is far more troublesome than any of them.

FLEA'BANE, *flē'bān* (*Pulicaria*): genus of plants of the nat. ord. *Compositæ*, sub ord. *Corymbiferæ*, having hemispherical imbricated involucres and yellow flowers; the whole plant emitting a peculiar aromatic smell, sometimes compared to that of soap, which is said to be efficacious in driving away fleas. One species (*P. dysenterica*), common in moist places, with oblong leaves, stem 12–15 inches high, cottony, and bearing panicled flowers, has considerable reputation in diarrhœa and dysentery. The Russian soldiers, in the expedition to Persia under Gen. Keith, were much troubled with dysentery, which was cured by this plant.—*Conyza squarrosa*, also called fleabane, belongs to a nearly allied genus.



Fleabane (*Pulicaria dysenterica*).

a, root; *b*, top of stem, with leaves and flowers; *c*, achene, with pappus; *d*, pistil; *e*, a floret of the disc; *f*, a stamen; *g*, a floret of the ray.

FLEAM, n. *flēm* [F. *flamme*, a lancet—from mid. L. *flebot'ŏmum*—from Gr. *phlebŏtŏmon*, a lancet—from *phleps*, a vein; *tŏmē*, a cutting: Dut. *vlieme*, a lancet, a sharp-pointed thing: Bret. *flemm*, the sting of a bee (see PHLEBOTOMY)]: an instrument for bleeding cattle; a gum-lancet. FLEAM-TOOTH, a tooth of a saw in the form of an isosceles triangle; a peg-tooth.

FLÈCHE, n. *flĕsh* [F. *flèche*, an arrow]: in *fort.*, a field-work consisting of merely two faces forming a salient angle pointing outward.

FLECHE, LA, *lâ flāsh:* town of France, dept. of Sarthe; agreeably situated on the right bank of the Loire, 24 m. s s.w. of Le Mans. It is well-built and has three principal streets, which are wide and well paved. Its principal building is the military school with a library of 15,000 vols. for the education of the sons of poor officers, or of soldiers who have highly distinguished themselves. The building now occupied by the school was a royal palace built by Henry IV., subsequently given by him to the Jesuits, and used as a Jesuit college. Here Prince Eugene, Descartes, and Picard the astronomer, were educated. F. has some trade in corn, hay, and wine, also manufactures of linen. hosiery, and gloves. Pop. (1881) 7,529; (1886) 7,977.

FLÉCHIER, *flā-she-ā'*, Esprit: 1632, June 10—1710, Feb. 16; b. Perues, France: pulpit orator. He was educated in the college of the Fathers of Christian Doctrine in Avignon, appointed prof. of rhetoric at Narbonne 1659, and removed to Paris and accepted a place as parish catechist 1661. The next year he wrote a Latin poem of great eloquence on Louis XIV.'s famous tournament, which attracted much attention to him, and soon afterward he was appointed preceptor in the family of a councilor of state. In 1673 he was elected a member of the French Acad.; and received from the king the abbey of St. Séverin, the post of reader to the dauphin, the bishopric of Lavaur 1685, and that of Nîmes 1687. His diocese contained numerous Huguenots, and on the revocation of the Edict of Nantes, his administration was confronted by ecclesiastical obstacles of serious moment. Yet so tender and moderate were all his dealings, that at his death Rom. Catholics and Protestants alike united in demonstrations of sincere grief. F., noted in early youth for the eloquence, beauty, and power of his language, sustained this distinction through life, and delivered a number of funeral orations which were esteemed masterpieces of rhetorical art.

FLECK, n. *flĕk* [Icel. *fleckr;* Dut. *vlecke;* Ger. *fleck,* a spot: a word imitative of something wet thrown down, or jerked as a dirty brush]: a spot; a blot; a stain.

FLECKNOE, *flĕk'nō,* Richard: date of birth unknown; d. 1678; said to have been an Irish Rom. Cath. priest. He came to London, mingled in the wars of the wits, and wrote several plays, all now forgotten. F. came under the lash of Dryden, whose satire, entitled *Mac Flecnoe,* is partly the model of Pope's *Dunciad* (q.v.), and will be remembered as long as the great satirist is remembered. From those who speak with some knowledge, we have the assurance that F. has been hardly dealt with; that though he did not rise to the rank of Dryden as a poet, he was the author of several fugitive pieces, not without grace, fancy, and happy turns of expression. Among his dramatic pieces are *Ermina, or the Chaste Lady; Love's Dominion* (printed 1654, dedicated to Cromwell's favorite daughter, Mrs. Claypole); and *The Marriage of Oceanus and Britannia.* His *Miscellanea or Poems of all Sorts,* appeared 1653.

FLED: see Flee.

FLEDGE, v. *flĕj* [Icel. *fleygr,* able to fly: Ger. *flügge,* feathered—from *fliegen,* to fly]: to be furnished with feathers and wings, as a bird; to feather an arrow. Fledg'ing, imp.: N. a covering of feathers. Fledged, pp.

flĕjd, covered with feathers. FLEDGE'LING, n. a bird newly fledged.

FLEE, v. *flē* [Icel. *flyja;* Dan. *flye*, to flee: AS. *fleon;* Ger. *fliehen;* L. *fugĕrĕ*, to flee]: to run with rapidity—*to flee*, as a man or beast—*to fly*, as a bird; to run from danger or for shelter; to hasten away; to avoid. FLEE'ING, imp. FLED, pp. *flĕd*, did flee; run. *Note.*—When a very great amount of speed is wished to be indicated, we apply *fly* to either man or beast.

FLEECE, n. *flēs* [AS. *flys;* Dut. *vlies*, a tuft of wool: Ger. *fliess*, a tuft of wool or hair]: the whole wool shorn from a sheep at one time: V. to shear or clip wool from; to spread over, as with wool; to strip or plunder. FLEECING, imp. *flē'sĭng*, stripping of money or property. FLEECED, pp. *flēst:* ADJ. furnished with a fleece; stripped by exactions; cheated of one's money. FLEE'CER, n. *-sėr*, one who strips or plunders. FLEE'CY, a. *-sĭ*, covered with wool; woolly; soft. FLEECE'LESS, a. without a fleece. FLEECE-WOOL, wool shorn from the living sheep, as distinguished from skin-wool from the skins of dead animals.

FLEER, v. *flēr* [Scot. *fleyr*, to make wry faces: comp. Norw. *flira*, to titter, to giggle]: to make a wry face; to grin; to sneer and mock; to treat disrespectfully: N. in *OE.*, mockery as expressed by words or looks; a flout. FLEER'ING, imp. FLEERED, *flērd*.

FLEET, v. *flēt* [from the notion of flowing water: Sw. *flyta;* Dan. *flyde*, to flow: AS. *fleotan*, to flow]: to flow away; to move rapidly; to vanish; in *OE.*, to pass away lightly, as, to fleet away time. FLEET'ING, imp. FLEET'ED, pp. FLEET, a. [It. *flusso;* Icel. *fliotr*, transitory, swift: Icel. *fljóta*, to float, to swim]: swift of pace; nimble; active. FLEET'ING, a. transient; passing rapidly. FLEET'LY, ad. *-lĭ*, nimbly; swiftly. FLEET'NESS, n. speed; swiftness; rapidity.

FLEET, n. *flēt* [AS. *flota*, a ship: Low Ger. *flote*, a raft: Icel. *floti;* F. *flotte*, a fleet (see FLEET 1)]: somewhat indefinite term for a number of war-ships or other vessels in company, or having one object or the same destination; portions of a F. are known as divisions or squadrons. In the *navy*, a F. is usually commanded by an admiral or a vice-admiral. *Note.*—The notion of flowing water seems to be the origin of the varied senses of FLEET, though some deem it allied to *float*.

FLEET, n. *flēt* [Low Ger. *flot*, a shallow: Icel. *fljot*, a stream]: in *OE.*, a shallow water; a tide creek; an inlet; a shallow stream; a bog: V. to take off the cream from milk; to gutter as a candle. FLEET'ING, imp. FLEET'ED, pp.

FLEET-BOOKS: see FLEET MARRIAGES.

FLEET MAR'RIAGES: secret, and often irregular marriages. The practice of contracting clandestine marriages was very prevalent in England before the passing of the first marriage act (see MARRIAGE). The chapels at the Savoy and at May Fair, in London, where long famous for the performance of these marriages; but no other place was equal in notoriety for this infamous traffic to the Fleet Prison. Before the passing of the 26 Geo. II. c. 33, there was no necessity in England for any religious ceremonial in the performance of marriage, which might be contracted by mere verbal consent, Hence it was not in virtue of any special privilege existing within the liberty of the Fleet that marriages at that place became so common; but rather from the fact, that the persons by whom they were performed, having nothing to lose either in money or in character, were able to set at defiance the penalties enacted from time to time with a view to restrain this public nuisance. These marriages were in greatest repute 1674 to 1754. The first notice of a Fleet marriage is in 1613, in a letter from Alderman Lowe to Lady Hickes, and the first entry in a register is in 1674. Till this time, it does not appear that the marriages contracted at the Fleet were clandestine; but in the latter year, an order having been issued by the ecclesiastical commissioners against the performance of clandestine marriages in the Savoy and May Fair, the Fleet at once became the favorite resort for those who sought a secret marriage. At first, the ceremony was performed in the chapel in the Fleet; but the applications became so frequent, that a regular trade speedily sprung up. By 10 Anne, c. 19, s. 176, marriages in chapels without banns were prohibited under certain penalties, and from this time, rooms were fitted up in the taverns and the houses of the Fleet parsons, for the purpose of performing the ceremony. The persons who celebrated these marriages were clergymen of the Church of England, who had been consigned for debt to the prison of the Fleet. These men, having lost all sense of their holy calling, employed touters to bring to them such persons as required their office. The sums paid for a marriage varied according to the rank of the parties, from half-a-crown to a large fee where the liberality and the purse combined to afford a large reward. During the time that this iniquitous traffic was at its height, every species of enormity was practiced. Young ladies were compelled to marry against their will; young men were decoyed into a union with most infamous women; and persons in shoals resorted to the parsons to be united in bonds which they had no intention should bind them, and which were speedily broken to be contracted with some new favorite. The sailors from the neighboring docks were steady patrons of this mode: it was stated by the keeper of one of the taverns, that often, when the fleet was in, two or three hundred marriages were contracted in a week. Persons of a more respectable character also at times resorted to the Fleet. Thus the Hon. Henry Fox was here married to Georgina Caroline, daughter of the second Duke of Richmond. Pennant thus describes the neighborhood of the Fleet in his time: 'In walking along the street in my youth, on the side next the prison, I have often been tempted by the question: "Sir, will you be pleased to walk in and be married?" Along this most lawless space was hung up the frequent sign of a male and female hand conjoined, with "marriages performed within" written beneath. A dirty fellow invited you in. The parson was seen walking before his shop, a squalid dirty figure, clad in a tattered plaid night-gown, with a fiery face, and ready to couple you for a dram of gin or a pipe of tobacco.'—*London*, p. 193. Registers of these marriages were kept by the various parties who officiated. A collection of these books, purchased by government 1821, and deposited in the consistory court of London, amounted to the amazing number of between two and three hundred large registers, and more than one thousand smaller books, called pocket-books. These registers were not received as evidence in a court of law, not because the marriage was invalid, but because the parties engaged in the ceremony were so worthless that they were deemed undeserving of credit. Various attempts were made to stop this practice by acts of parliament: penalties were imposed on clergymen celebrating any marriage without banns; but these provisions were without effect upon men who had nothing to lose. At length, the nuisance became intolerable, for, owing to the difficulty of proving these marriages, respectable parties, who in folly had entered into them, found it often impossible to establish their marriage, and great confusion was produced. The act of the 26th Geo. II. c. 33, was therefore passed, which struck at the root of the matter by declaring that all marriages, except in Scotland, solemnized otherwise than in a church or public chapel, where banns have been published, unless by special license, should be utterly void. This act met strenuous opposition in the house of commons, especially by Mr. Fox, who had himself been married in the Fleet, but ultimately it was passed into a law. The public, however were unwilling to surrender their privilege, and in 1754, March 26, the day before the act came into operation, there were no less than 217 marriages entered in one register alone. See Burn's *History of Fleet Marriages.*

FLEET PRISON, or THE FLEET: celebrated London jail, which stood on the east side of Farringdon Street, on what was formerly Fleet Market. The keeper was called the Warden of the Fleet. It derived its name from the Fleet rivulet, named from its rapidity, which flowed into the Thames, and is now one of the common sewers. By the Act 5 and 6 Victoria, the Fleet Prison and the Marshalsea were abolished, and their functions transferred to the Queen's Bench, under the new name of the Queen's Prison. The Fleet was the king's prison as far back as the 12th c., and a receptacle for debtors since about the same period. The followers of Wat Tyler burned it in the reign of Richard II. In the 16th and 17th c., it acquired high historical interest from its having been the prison of the religious martyrs of the reigns of Mary and Elizabeth, and of the political victims of the courts of the Star Chamber and High Commission in that of Charles I. On the abolition of the Star Chamber 1641, it became a place of confinement for debtors and persons committed for contempt from the courts of Chancery, Exchequer, and

Common Pleas. During the 18th c., it was the scene of every kind of atrocity and brutality, from the extortion of the keepers and the custom of the warden underletting it. The Fleet was several times rebuilt; the last building was erected after the burning of the older one in the Gordon riots 1780, the predecessor of which had been destroyed in the great fire of London 1666. Latterly, it usually contained 250 prisoners, and kept ward of about 60 outdoor *detenus* for debt, privileged to live within the rules.

FLEET'WOOD, or FLEETWOOD-ON-WYRE, *flēt'wûd-ŏn-wīr:* small but thriving town, seaport, and military station of England, county of Lancashire, on a promontory at the mouth of the estuary of the Wyre, about 20 m. s.w. from Lancaster. It is a modern town, and owes its origin and importance to its facilities for railway and steam-vessel communication. It is handsomely laid out, has an excellent harbor, and is a favorite resort for sea-bathing. There was formerly a govt. school of musketry, which promised to be for the north of England what Hythe and Aldershott are for the south, but it is now discontinued. In 1880, vessels entered 1,138, of 388,019 tons; cleared 1,120, of 376,733 tons. Pop. (1871) 4,428; (1881) 6,513.

FLEG, n. *flĕg* [Gael. *flaiche*, a sudden squall or gust]: in *Scot.*, a sudden blow; a box on the ears; a kick; a fright; a scare.

FLEMING, n. *flĕm-ĭng* [Ger. *Flamander*—from F. *Flamand*, nickname given to the Flandrians on account of their tallness]: in *chh. hist.*, the same as Flandrians (q.v.).

FLEMING, n. *flĕm'ĭng:* a native of Flanders, in Belgium. FLEMISH, a. *flĕm'ĭsh*, of or from Flanders. FLEMISH-BOND, particular mode of brick-laying in a wall so as to tie and break joint. FLEMISH-BRICK, kind of brick used for paving; 72 will pave a square yard. They are of yellowish color and harder than the ordinary brick. FLEMISH-EYE, in *naut.*, an eye made at the end of a rope without splicing. FLEMISH-HORSE, in *naut.*, a foot-rope for the man at the earing in reefing.

FLEM'ISH LANGUAGE AND LITERATURE: dialect and literature of Flanders. The Vlaemisch or Flemish is a form of Low German still spoken in the Belgian provinces of E. and W. Flanders, Limburg, Antwerp, N. Brabant, and in parts of Holland and the Walloon provinces of Belgium. So little change has taken place in this dialect, that the form of speech in which the Council of Liptines drew up (in 742) the creed, in which pagans were made to express their renunciation of idolatry on being converted to Christianity, requires only the alteration of a few letters to make it intelligible to a modern Fleming. Flemish has much affinity with the Frisian, and constitutes, together with modern Dutch (originally identical with it, and now differing from it in only a few orthographical and otherwise unessential particulars), the national tongue of the whole of the Low Countries. The most ancient record of Flemish, is a fragment of a translation in prose of the

Psalms a thousand years old In the 13th c., public deeds began to be drawn up in the vernacular, which are perfectly intelligible in the present day (as the Ordinance of Henry I. of Brabant, 1229, in the *Brussels Book of Privileges*). In the same century, J. van Maerlant, 'father of Flemish poets,' author of *The Historical Mirror, Wapen Martin, Rymbibel,* etc., and W. van Utenhove composed numerous poems, and translated from the French and German, and very probably from the Latin. Willems and other critics believe that to the Flemish must be ascribed the honor of the original and entire poem of *Reinært Vos,* the first part of which they refer to the middle of the 12th c., while the second part is attributed to W. van Utenhove, and supposed to have been written about 1250. The 14th c. was remarkable for the numbers and excellence of the Flemish *Sprekkers, Zeggers,* and *Vinders,* or wandering poets, some of whose works have been published by Blommaert; and for the origin of the Chambers of Rhetoric, which exerted a marked influence on the progress of literature during succeeding ages, and became the arbiters of literary and dramatic fame through the Netherlands generally. In the 16th c., the French element gained ascendency, and the old Flemish lost much of its original terseness and purity. Numerous translations of the Scriptures appeared; among the most remarkable of which are the Psalms by Dathenus (1556), and by Marnix (1580), author of the *Roomsche Biekorf* (1569). The translation of the entire Bible was not effected till 1618, when the General Synod of Dort decided to employ learned men capable of giving a correct version from the Hebrew and Greek texts; and this great work was completed by two Flemings, Baudaert and Walons, and two Dutchmen, Bogermann and Hommius. Strenuous efforts were made at this period to give greater freedom to the Flemish language, hence this original Flemish version of the Bible has become a standard in regard to the construction and orthography of the language. Hooft, Vondel, and Cats are the three men whose names stand foremost among Flemish writers of the 17th c. Hooft was a poet, but is known best by his *History of the Netherlands,* which is held in high esteem by his countrymen. Vondel, one of the leading men of his day, made his tragedies the vehicles of hurling most cutting satire on every obnoxious measure of the government; and his works still maintain their ground. He had great versatility of powers; and in his latter years, his talents were directed to the exaltation of Rom. Catholicism, to which he had been converted. Cats was essentially the poet of the people; and for 200 years, his works, popularly known as the *Household Bible,* have been cherished alike among the poor and the wealthy. Although Cats was a skilful lawyer, an active statesman, and a profound scholar, he found time to compose a great number of works, as the *Zorgvliet; Trouwring* (the Wedding Ring); *Houwelyck* (Marriage); which show intimate acquaintance with the every-day life of his countrymen. His writings are solid and informing, but dull and prosaic, and seldom reach the point of being interesting. The 18th c. was barren of poetic genius in the Low Countries, but it produced several good philologists, as Stevens, Huydecoper, and Ten Kate, the latter of whom is the author of a work on the Flemish language, which has served as a fundamental authority for modern writers. The arbitrary measures of the French govt. under Napoleon against the official use of Flemish, had the effect of crushing for a time the spirit of nationalism, while it completely annihilated native literature; and it was not till after the revolution of 1830, that the Flemish language regained its footing in the Belgian provinces. This revival of the national form of speech is due mainly to the unremitting efforts of such writers as Willems, Bilderdijk, Cornelissen, Blommaert, Conscience, Delecourt, Ledeganck, etc., whose works have imparted fresh vigor, and greater grammatical precision to the Flemish. In 1841, on the occasion of a linguistic congress at Ghent, the members of the govt. for the first time publicly recognized the existence of the Flemish element in the people, and addressed the meeting in the national dialect. The last 30 years have confirmed this movement; and while the best foreign works have been rendered into Flemish, the writings of Blommaert, Conscience (q.v.), and other native authors have been translated into many European tongues. Vandenhoven (i.e., Delecourt), *La Langue Flamande* (1844); Lebrocquy, *Analogies Linguistiques* (1845); Höfken, *Vlämisch Belgien* (Bremen 1847); the bibliographical works of Snellaert (1867) and De Poller (1867); also Düringsfeld's *Von der Schelde bis zur Maas* (Leipzig 1861).

FLEMISH SCHOOL in Painting: see Painting.

FLEMMING, *flĕm'ĭng,* Paul: 1609, Oct. 5—1640, Apr. 2; b. Hartenstein, in the Erzgebirge: German poet. He studied medicine at Leipsic, but retired to Holstein 1633. In 1635, he was attached to the splendid embassy to Persia. He returned 1639, married, and resolved to settle as a physician in Hamburg, but died there the next year. F. stands at the head of the German lyric poets of the 17th c. His *Geistliche und weltliche Poemata* (Jena 1642) contain many exquisite love songs, which, for more than a century, remained unequalled in finish and sweetness. Other poems are distinguished for enthusiasm of feeling, ardent patriotism, and manly vigor, while his sonnets are marked by strength and originality. F.'s longer poems describe the adventures of his journey; occasionally with great spirit, though they are not free from the weaknesses of his time. His beautiful hymn, *In allen meinen Thaten,* composed before his journey to Persia, proves his genius as a writer of sacred songs. His life, with his select poems, was published by Schwab (Stuttgard 1820). Compare Knapp, *Evangelischer Liederschatz* (Stuttg. 1837), and Müller in the *Bibliothek Deutscher Dichter des 17 Jahrhundert* (3 vols. Leipsic 1822); and Varnhagen von Ense, vol. IV. of the *Biographische Denkmale.*

FLENSBORG, *flĕns'bŭrch:* important town in the prov.

ince of Schleswig-Holstein (now Prussian; see SLESVIG), at the extremity of the Flensborg Föhrde, an inlet of the Baltic, and 19 m. n. of the town of Slesvig. It is cap. of a bailiwick of the same name, which includes the n. part of the district supposed to have been the country of the Angels, or Angli. F. is said to have been founded in the 12th c., and named from its founder the Knight Flenes. In 1284, it received municipal rights from King Valdemar. F. is pleasantly situated, and has a good harbor, breweries and distilleries, iron and brass foundries, oil mills and brickworks, manufactures paper and glass, and has a great yard for building iron ships. The fisheries are productive, and the trade in grain and timber, etc. is brisk. Pop. (1880) 30,956.

FLERS, *flär:* town of France, dept. of Orne, in the n. of France, 35 m. w.n.w. of Alençon. It has an old castle, burned down in the Chouan war, but since restored. F. has considerable manufactures of linen, fustian, and especially of ticking. Pop. (1886) 11,257.

FLESH, n. *flĕsh* [Dut. *vleesch;* Ger. *fleisch;* AS. *flæsc,* flesh: Icel. *flicki,* a large piece of meat]: that part of an animal underlying the skin or covering, as distinguished from the bones and fluids; muscle and fat; animal food; the body, as distinguished from the soul; human nature; carnal state; present life; the pulpy part of food; sensual appetite; kindred; family: ADJ. of or like flesh, as *flesh-colored,* etc.: V. in *OE.*, to put to use for the first time by cutting flesh, as a sword; to initiate dogs or hawks into hunting by giving them flesh; to harden. FLESH'ING, imp. FLESHED, pp.: ADJ. *flĕsht,* fat; having abundance of flesh; in *OE.*, initiated. FLESHER, n. *flĕsh'ėr,* in *Scot.*, one who kills and dresses meat for the market; a butcher. FLESH'INGS, n. plu. coverings resembling the natural skin, worn by actors. FLESH-BRUSH, a soft brush to be used on the skin to promote circulation and excite the surface secretions. FLESH-WOUND, a wound affecting the flesh only. FLESH-TINTS, colors used in representing the naked body. FLESH'LESS, a. without flesh. FLESH'LY, ad. *-lĭ,* animal; not vegetable; carnal; not spiritual. FLESH'LINESS, n. FLESH'Y, a. *-ĭ,* full of flesh; plump. FLESH'INESS, n. corpulence; grossness. FLESH-POTS, vessels in which to cook flesh; good or high living. ARM OF FLESH, mere human strength.

FLESH: ordinary term for muscular tissue. After the removal of the blood-vessels, nerves, connective (or cellular) tissue, etc., the F. is found to consist of various textural elements (see MUSCLE). Numerous analyses have been made of the muscular substance of various animals. In Dr. Day's translation of Simon's *Animal Chemistry,* published by the Sydenham Soc., are analyses of the F. of man, the ox, calf, pig, roe, pigeon, fowl, carp, and trout. The following table gives the determinations of the individual constituents of the flesh of oxen, or, in ordinary language, of beef freed, as far as possible, from blood-vessels, etc., and may be regarded as fairly representing the composition of F. generally.

		Per cent.	Per cent.
Water	varies from	74·0 to	80·0
Solid constituents	vary "	26·0 "	20·0
		100·0	100·0
The latter being made up of			
Muscular fibre which	varies from	15·40 "	17·70
Gelatigenous substance	" "	0·60 "	1·90
Albumen	" "	2·20 "	3·00
Creatine	" "	0·07 "	0·14
Creatinine		undetermined.	
Inosic acid		do.	
Fat	" "	1·50 to	2·30
Lactic acid ($C_3H_6O_3$)	" "	0·60 "	0·68
Phosphoric acid	" "	0·66 "	0·70
Potash	" "	0·50 "	0·54
Soda	" "	0·07 "	0·09
Chloride of sodium	" "	0·04 "	0·09
Lime	" "	0·02 "	0·03
Magnesia	" '	0·04 "	0·08

Long as the above list of subtances is, it does not include all the ingredients of F. In the freshly expressed muscular juice, which exhibits a strong acid reaction (from free lactic acid, and from acid phosphates of the alkalies), we find also small quantities of Sarcine or Hypoxanthine (q.v.), and of formic, butyric, and acetic acids—which may, however, be mere products of decomposition; very minute quantities of uric acid, and sometimes a trace of urea, which however, occurs in very appreciable quantity in the muscles of persons who have died of cholera, and in very considerable quantity in the flesh of the plagiostomous fishes, while in other fishes not a trace of it can be detected—an apparent anomaly to which at present there is no clue; and in the juice of the heart of mammals, and in smaller quantity in their other muscles, a kind of sugar termed Inosite (q.v.). Bernard, has recently discovered Glycogen (q.v.) in the muscles of the embryos of various animals.

In regard to the inorganic constituents of the juice of flesh, Liebig directs especial attention to the fact, that this fluid 'in all animals is particularly rich in potash, and that it contains also chloride of potassium, with only traces of chloride of sodium; while in the blood only proportionally small quantities of the salts of potash and preponderating quantities of the salts of soda and of common salt, are present.' He further notices the constant excess of the phosphates over the chlorides, and of the phosphate of lime over that of magnesia in the former fluid, as points of physiological importance. For the value of these investigations, see TISSUES.

It is worthy of notice, in connection both with physiology and dietetics, that the dried flesh of the ox is identical in its ultimate composition with dried blood, as is shown by the following analyses by Prof. Lyon Playfair:

	Beef.	Ox-blood.
Carbon, . .	51·83	51·95
Hydrogen, . . .	7·57	7·17
Nitrogen, . .	15·01	15·07
Oxygen, . . .	21·37	21·39
Ashes, . . .	4·23	4·42

This analysis singularly confirms the statement made previously by an eminent French physiologist, that so far as ultimate organic composition is concerned, 'the blood is liquid flesh.'—For further information, see Liebig's *Researches on the Chemistry of Food*, translated by Gregory Gamgee's *Physiological Chemistry* (1880); or other standard works on the subject.

FLESH-FLY, or BLUE-BOTTLE-FLY (*Musca vomitoria*): insect of the same genus with the common HOUSE-FLY (q.v.), which it much exceeds in size, though it is not equal in size to the Blow-fly (q.v.). The forehead is rust-colored, the thorax grayish, the abdomen blue with three black bands. The expanse of wings is nearly one inch. It deposits its eggs on flesh, for which purpose it often enters houses, having a remarkably delicate sense of smelling. The maggots are frequent on meat in summer, notwithstanding all care that can be taken.—A nearly allied species (*M. Cæsar*), distinguished by its golden green color, is found in houses from the beginning of spring to the end of autumn. Another (*M. lardaria*), with silky tawny face, a black stripe on the crown, thorax glittering with four black stripes, and abdomen blueish gray, tesselated with black, is most frequent in the end of autumn, frequenting bushes of ivy and late flowers, and is also a pest of the larder.

FLET, n. *flĕt*, or FLEAT, *flēt* [Ger. *flechten*, to plait]: mat of plaited straw for protecting a horse's back from injury by the load.

FLETA, *flē'ta:* title of a valuable treatise on the law of England. It is not known by whom this treatise, one of the earliest authorities on English law, was written, and it derives its title from the circumstance that it was written in the Fleet prison. Lord Campbell remarks—*Lives of the Chancellors*, i. 166 and note: 'I shall rejoice if I do tardy justice to the memory of Robert Burnel, decidedly the first in this class, and if I attract notice to his successors, who walked in his footsteps' To them, too, we are probably indebted for the treatises entitled *Fleta and Britton*, said to have been written at the request of the king, and which, though inferior in style and arrangement to Bracton, are wonderful performances for such an age. *Fleta* must have been written after the 13th year of the king (Edward I.), and not much later; for it frequently quotes the statute of Westminster the second, without referring to the later statutes of the reign.

FLETCHER, *flĕtch'ėr*, ANDREW, of Saltoun: Scottish patriot and politician: 1653–1716; son of Sir Robert F. and Catherine Bruce, daughter of Sir Henry Bruce of Clackmannan. Notwithstanding the strong anti English feelings which characterized him through life, F. was of English descent by the father's side; his father being the fifth in the direct line from Sir Bernard Fletcher of the county of York. But his mother was of the royal House of Scotland, the first of the Clackmannan family having been the third son of the Lord of Annandale, Robert de Bruce, grandfather of the great King Robert. F.'s father, who died in his childhood, consigned him to the care of Gilbert Burnet, then minister of Saltoun, afterward the well-known Bp. of Salisbury; by whom he was instructed not only in literature and religion, but in those principles of free government of which he afterward became so zealous an advocate. As early as 1681, when he sat in parliament for the first time as commissioner for E. Lothian, F. offered so determined opposition to the measures of the Duke of York (afterward James II.), then acting as the royal commissioner in Scotland, that he found it necessary to retire, first into England, and then into Holland. He there entered into close alliance with the English refugees, who had assembled in considerable numbers; and on his return to England 1683, he shared the counsels of the party of which Russell, Essex, Howard, Algernon Sydney, and John Hampden (grandson of the still more famous patriot of the same name) were the leaders. Though usually regarded as a republican, F.'s political creed, like that of Algernon Sydney, approached far nearer to aristocracy than to democracy in the modern sense; for though he was disposed to restrict the monarchical element of the constitution within the narrowest limits, if not to abolish it altogether he was so far from being an advocate for a universal participation in political rights, that one of his favorite schemes for the reformation of the hosts of vagrants and paupers by whom Scotland was infested in his day, consisted in the establishment of slavery in the form in which it had existed in the classical nations of antiquity. On the discovery of the Rye House plot, F. returned to Holland. His next visit to England was as a volunteer under the Unfortunate Duke of Monmouth 1685; but he was compelled to leave the insurgent army. at the beginning of the enterprise. in consequence of his having shot the mayor of Lynn, with whom he had had a personal quarrel about a horse. The next hiding-place which F. selected was Spain; but he had no sooner arrived, then he was thrown into prison at the instance of the English ambassador, and would have been transmitted to England, to share the fate of his fellow-patriots, had he not been mysteriously delivered from prison by an unknown friend. From Spain he went to Hungary, where he entered the army as a volunteer, and greatly distinguished himself. He returned to England at the Revolution. A few years later, he met in London, it seems accidentally, the famous William Paterson, founder of the Bank of England, and projector of the Darien Expedition; and it was at F.'s solicitation that Paterson went to Scotland, and offered, to the acceptance of his countrymen, a project which he had originally intended should be carried out by the far greater resources either of the trading communities of the Hanse towns, or of the princes of the German empire The bitterness caused by the treatment which the Darien colonists received at the hands of King William's govt. tended to confirm F. and his friends in their opposition to the Union with England, and led to his delivering in parliament those spirited harangues in favor of an exclusive Scottish nationality, which still stir the blood of his countrymen. After the

Union, he retired in disgust from public life, and died in London F.'s writings, originally in the form of anonymous tracts, were collected and reprinted, London 1737.

FLETCHER, **Benjamin**: colonial gov. of N. Y. 1691 98; gov. of Penn. 1693–95. He received both commissions from William and Mary, that for Penn. being illegally granted. He was imperious, dissolute, avaricious, and reckless, and was charged with secretly encouraging piracy for personal gain. William and Mary seem to have used him for some unexplained purpose as they illegally gave him control of the Conn. militia (which act was nullified by the royal council on appeal) and beside ignoring William Penn's rights in his large colony, supported by an autograph letter a demand on the Penn. assembly by F. for money. F attempted to establish the Church of England in New York in spite of the opposition of the citizens, was at length deposed, and was succeeded as gov. by Richard, Earl of Bellomont.

FLETCHER, **Giles**: abt. 1580–1623; son of Dr. Giles F., Queen Elizabeth's ambassador to the court of Russia; he was elder bro. of Phineas F., and cousin to John F. the dramatist. He was educated at Cambridge, entered the priesthood of the Anglican Church, and died at his living at Alderton. His chief poetical word is a sacred poem, entitled *Christ's Victory and Triumph,* which appeared at Cambridge 1610. This poem, once admired, is now unknown to general readers, and is remarkable chiefly for having to some extent molded the majestic muse of Milton. His poems, with those of his father, were edited by Dr. Grosart 1869.

FLETCH'ER, **John** (Dramatist): see **Beaumont and Fletcher.**

FLETCHER, **John William** (FLÉCHIÈRE, **Jean Guillaume de la**): 1729, Sep. 12—1785, Aug. 14; b. Nyore, Switzerland: collaborator of the Wesleys. He was educated at Geneva and studied some time for the ministry, but the extreme Calvinistic doctrines of the day led him to abandon his intention and engage in military service, first with the Portuguese and then the Dutch. On the conclusion of peace he went to England, was a tutor till 1755, then joined the Methodist Soc., and 1757 took orders in the Church of England. Declining the offer of a rich parish, he accepted the post of vicar of Madeley and distinguished himself by his zealous labors among a debased and neglected people. A considerable part of his work was done under the auspices of the Countess of Huntingdon, who also appointed him pres. of her theol. school at Trevecca, Wales. He was associated with the Wesley brothers, George Whitefield, and others in founding Methodism, and wrote numerous works, including *Checks to Antinomianism,* published 8 vols., New York.

FLETCH'ER, **Julia Constance**: daughter of the Rev. James Cooley F., missionary; b. Rio Janeiro, Brazil, 1853: author. She circumnavigated the S. American continent with her father before she was 4 years old, subsequently travelled with him through the United States, France, England, Egypt, and Syria, and since 1874 has resided chiefly in Rome. Her first verses, *Under the Daisies*, were first published in the *Galaxy* magazine when she was 13 years old. Under the *nom de plume* of George Fleming she has published the following novels *Kismet* (Boston 1877); *Mirage* (1878); *The Head of Medusa* (1880); *Sonnets of Gaspara Stampa* (1881); *Vestigia* (1884); and *Andromeda* (1885).

FLETCH′ER, Phineas 1584–1660; younger son of Dr. Giles F. (see Fletcher, Giles). He was educated at Eton and Cambridge, and became rector of Hilgay, in Norfolk, 1621, and died there. His most important poem, the *Purple Island, or the Isle of Man*, was published 1633. It contains an elaborate description of the human body and mind —the former being given with great anatomical minuteness. The mind is represented as being beleaguered with the vices, and likely to be subdued, when an angel comes to the rescue—the angel being James I. Although formal and pedantic, the *Purple Island* abounds in fine passages, in which the lusciousness of Spenser and the gravity of Milton are curiously mingled. His poetical works were edited by Dr. Grosart, 4 vols. 1868.

FLEUR-DE-LIS, n. *flėr-dė-lē′* [F. flower of lily (see under Flower)]: a variety of iris (q.v.); in *OE.*, *flower-de-luce*. Fleurons, n. plu. *flėr·awng* [F.]: flowers; ornaments.

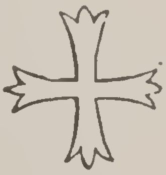
Fleur-de-Lis.

FLEUR-DE-LIS, *flėr-dė-lē:* the royal emblem of France. Authorities are divided as to whether this celebrated emblem is derived from the white lily of the garden, or from the flag or iris, which, as generally represented, it more resembles both in form and color. 'Ancient heralds,' says Newton (*Display*, p. 145), 'tell us that the Franks of old had a custom, at the proclamation of their king, to elevate him upon a shield or target, and place in his hand a reed or flag in blossom, instead of a sceptre; and from thence the kings of the first and second race in France are represented with sceptres in their hands like the flag with its flower, and which flowers became the armorial figures of France.' However this may be, or whatever the value of the other legendary tales, such as that a bluebanner, embroidered with golden fleurs-de-lis, came down from heaven; that an angel gave it to King Clovis at his baptism, and the like; there is little doubt that, from Clovis downward, the kings of France bore as their arms first an indefinite number, and latterly three golden lilies on a blue field, or, as heralds would say, azure, three fleurs-de-lis, Or.—It was Charles VI. who reduced what had hitherto been the indefinite number of fleurs-de-lis to three, disposed two and one; 'some conjecture upon account of the Trinity, others say, to represent the three different races of the kings of France.'—Nisbet, i. 383. Many English and Scotch families bear the fleur-de lis in some portion of their shield, and generally with some reference to France.

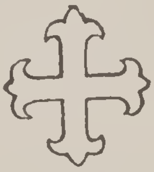
FLEURUS, *flėh-rüs:* small town of Belgium, province of

Hainault, n. of the left bank of the Sambre, 15 m. w. of Namur. It has been the scene of several contests, the last and most important, the battle of F., 1794, June 26, between the army of the French Republic, 89,000 troops under Jourdan, and the allies, inferior in numerical strength, under the Prince of Saxe-Coburg. The latter leader gave orders for a retreat at the very moment when a resolute advance might have decided the victory in his favor, and the result was, that Jourdan was enabled to unite his army with those of the Moselle, the Ardennes, and the North, and that the allied forces were compelled for a time to evacuate Flanders. Pop. 5,087.

FLEURY, *flėr'ĭ*, or Flory, or Flowry, or Fleurette, *flėr-ĕt'*, etc., in Heraldry: term denoting that the object is adorned with fleurs-de-lis; a cross-F., for example, is a cross the ends of which are in the form of fleurs-de-lis. There are several varieties in the modes of representing these crosses, which have led to trivial distinctions by heralds, but they all are distinguishable from the cross-potance, or potancée, incorrectly spelled patonce by English heralds. (Mackenzie's *Science of Heraldry*, p. 44.) In the latter, the limbs are in the form of the segments of a circle, and the foliation is a mere bud; whereas the cross-F. has the limbs straight and the terminations distinctly floriated. Thus—



Cross-potance.



Cross-fleury.

Perhaps the most celebrated instance of this bearing is in the case of the double prepuce flowery and counter-flowery gules which surrounds the red lion in the royal arms of Scotland, and which Charlemagne is said to have conferred on Achaius, King of Scotland, for assistance in his wars. As to this historical occasion some doubt remains, though Nisbet (ii. 101) is extremely positive in asserting it.

FLEURY, *flėh-re'*, Claude: 1640, Dec. 6—1723, July 14; b. Paris: French church historian. He was educated for the law, but subsequently took priest's orders. In 1672, he became tutor to the young Prince de Conti, who was brought up with the dauphin; and later to the Comte de Vermandois, natural son of Louis XIV. After the death of the Comte, 1683, the French monarch appointed him, under Fénelon, tutor to the Princes of Burgundy, Anjou, and Berri, and abbot of the Cistercian monastery of Loc-Dieu. When the princes had completed their education, F. was rewarded with the priorate of Argenteuil. The Duke of Orleans selected him for confessor to the young king, Louis XV., giving as his reason for so doing, that F. was neither Jansenist, nor Molinist, nor Ultramontanist, but Catholic. F. held this office till 1722, when the infirmities of age compelled him to resign it. F. was learned, modest, mild, and kindhearted, simple in manners, and upright in conduct. Among his numerous works are: *Mœurs des Israélites* (Paris 1681); *Mœurs des Chrétiens* (Paris 1662); *Traité du Choix et de la Méthode des Études* (Paris 1686); *Institution au Droit Ecclésiastique* (1687); and, above all, the *Histoire Ecclésiastique* (20 vols. Paris 1691–1720). On this work, F. labored 30 years. It is marked by great learning, and, on the whole, by a judiciously critical spirit. What may be called his professional sympathies are held in check by a noble desire to be impartial, which might well rebuke the unveracious partisanship of many Protestant writers. Semler (q.v.) eminent German theological professor, avowed that his own lectures were at first mainly extracts from the *Histoire Ecclésiastique.* Even Voltaire praised it. 'The history of F.,' says he, 'is the best that has ever been executed.' D'Alembert and many others recommend F.'s style as a model of elegant simplicity. The so-called *Abrégé de l'histoire Ecclésiastique de Fleury*, published Berne 1776, is ascribed to Frederick the Great. A posthumous work of F.'s, entitled *Discours sur les libertés de l'Eglise Gallicane,* has always been very popular.

FLEURY, *fléh-re'*, Louis de, Chevalier and Viscount: b. France, abt. 1740: soldier. He was educated for a military engineer, was a maj. in the French army, came to America soon after the beginning of the revolutionary war, and was given a captain's commission by Washington in person. He served at Fort Mifflin on the Del. river, was presented by congress with a horse for gallantry at Brandywine, was promoted lieut.col. 1777, Nov. 26, was sub-inspector under Gen. Steuben during the winter 1777–8, appointed adj.gen. of Gen. Lee's div., 1778, June 4, was second in command in the R. I. expedition, and commanded a battalion of light inf. under Washington himself. At the storming of Stony Point, 1779, July, he led the van of the right column, was the first to enter the works, and captured the British colors, and for his bravery received the thanks of congress and a silver medal. Subsequently he served under Rochambeau, and returned to France with him.

FLEW, v. *flô:* did fly: see Fly.

FLEWS, n. plu. *flôz* [Low Ger. *flabbe,* the chops, thick lips]: in *OE.*, the chops of a dog; the lateral hanging parts of the upper lips of dogs. Flewed, a. *flôd,* having flews.

FLEX, v. *flĕks* [L. *flexus,* bent]: in *anat.*, to bend or fold up a joint. Flex'ing, imp. Flexed, pp. *flĕkst.*

FLEXIBLE, a. *flĕks'ĭ-bl* [F. *flexible*—from L. *flexĭb'ĭlĭs,* that may be bent—from *flexus,* bent: It. *flessibile*]: pliant; yielding to pressure; not stiff; obsequious; docile. Flex'ibly, ad. *-ĭ-blĭ.* Flex'ibleness, n. *-ĭ-bl-nĕs,* or Flex'ibil'ity, n. *-ĭ-bĭl'ĭ-tĭ* [F. *flexibilité*]: pliancy; the opposite of stiffness. Flexile, a. *flĕks'ĭl,* easily bent.—Syn. of 'flexible': pliable; supple; yielding; tractable; manageable; ductile; wavering; inconstant; fickle.

FLEXIBLE SANDSTONE: see Itacolumite.

FLEXION, n. *flĕk'shŭn* [F. *flexion*—from L. *flexĭōnem,* a bending—from *flexus*, bent]: the act of bending; a double; a fold (see FLEXURE). FLEXOR, n. *flĕks'ŏr* [L. that which bends or contracts]: a muscle which bends a joint.

FLEXUOUS, a. *flĕks'ū-ŭs*, or FLEX'UOSE, a. *-ōs* [L. *flexŭōsŭs*, full of windings, tortuous—from *flexus*, a bending]: winding; unsteady or wavering; in *bot.*, having alternate curvations in opposite directions; bent in a zigzag manner. FLEX'URE, n. *-ūr* [L. *flexūră*, a bending or winding], also FLEXION, a joint, the part bent; the act of bending; the bending or curving of a line or figure (see CURVATURE). A curve is said to have a point of *contrary* flexure at the point where it changes its character of concavity or convexity toward a given line. In the art of building, flexure denotes the bending of loaded beams. If a beam, supported at its two ends, be loaded, it bends, its lower surface becoming convex, and its upper concave. In this bending, the particles in the lower surface are drawn away from each other, and those in the upper are more closely packed together, while between the surfaces there is a line called *the line of no disturbance,* wherein the particles are neither drawn asunder nor compressed, and from which the mathematical theory of the flexure of beams starts. Experiments show that the flexure of solid beams, supported at their ends, and loaded, varies—(1) directly as the load; (2) inversely as the product of their *breadths,* and the cube of their *depths;* and (3) directly as the cube of the distance between the supports, while the flexure, if the load be uniformly distributed over the beam, is $\frac{5}{8}$ of the amount produced by the load placed on its centre: see STRENGTH OF MATERIALS.

FLICKER, v. *flĭk'ėr* [imitative of a flapping sound: Ger. *flackern*, to flare, to flutter: Dut. *fliggeren*, to flutter: Icel. *flokra*, to flutter]: to twinkle, as a light; to flutter; to waver. FLICK'ERING, imp. FLICK'ERED, pp. *-ėrd*. FLICK'ERINGLY, ad. *-ĭng-lĭ*. FLICK, v. *flĭk*, to whip lightly. FLICKER-MOUSE, a bat; the flitter-mouse or flinder-mouse.

FLIEDNER, *flēd'nėr*, THEODOR, D.D.: 1800, Jan. 21—1864, Oct. 4; b. Eppstein, near Wiesbaden, Germany: philanthropist. He was educated in the universities of Giessin and Göttingen and the theol. seminary at Herborn, was a private tutor in Cologne one year, received a license to preach 1820, and was called to a small Prot. colony at Kaiserswerth, a Rom. Cath. town on the Rhine below Düsseldorf, 1821, Nov. His people were so poor that they could only offer him 180 Prussian dollars per annum, and four weeks after he settled there they were rendered entirely destitute by the failure of a large silk-factory, in which a great portion of them worked. With great diffidence he started on a long journey by foot to raise money to relieve his people and hold them together, and in a single week collected 1,200 thalers. In 1823, June, he made a tour of Holland and England and begged sufficient money for the permanent endowment of his congregation. While in England, he became intimate with the humane work of Elizabeth Fry, and on his return to Germany visited numerous penal and reformatory institutions; tried alone to remedy the evils prevailing in them, and established the first German soc. for improving prison discipline. He began his work for the reformation of convicts by converting a summer-house in his garden at Kaiserswerth into a home for a discharged and destitute female prisoner anxious to reform. In 1836 he founded the order of Evangelical Deaconesses, a Prot. counterpart of the Rom. Cath. Sisters of Charity without any ascetic or monastic features, and in its interest visited Holland, England, and Scotland 1832, 1853, the United States 1849, Jerusalem 1851, and the east as far as Jaffa 1857. The deaconesses are divided into two classes, nursing sisters and teaching sisters. Besides the Christian hospitals, scattered through Europe, Asia, and the United States, in 1889 there were abt. 60 houses of Prot. deaconesses with 6,000 sisters—growing monuments to the practical philanthropy of the poor German pastor of Kaiserswerth.

FLIER, n *flī'ėr* [see FLY]: one who flies; that part of a machine which equalizes and regulates the motion of the whole; a fly-wheel.

FLIES, SPANISH or BLISTERING: see CANTHARIS.

FLIGHT, n. *flīt* [Icel. *flug;* AS. *floc;* Dut. *vleuge*, the act of flying (see FLY)]: a hasty removal; the act of flying or fleeing; a volley or shower, as of darts or arrows; an excursion, as, a flight of the imagination: a mounting; a soaring; an extravagant sally, as of ambition; space passed, as by flying; a flock of birds or winged creatures; birds produced in the same season; a series or range, as stairs; in *OE.*, the anc. sport of shooting with arrows. FLIGHTER, n. *-ėr*, in *brewing*, a horizontal vane revolving over the surface of wort in a cooler, to produce a circular current in the liquor. FLIGHT'Y, a. *-ĭ*, fickle in disposition of mind; somewhat disordered in mind; in *OE.*, fleeting; swift. FLIGHT'ILY, ad. *-lĭ* FLIGHT'INESS, n. state or quality of being flighty or volatile; levity; giddiness.—SYN. of 'flightiness': lightness; volatility; wildness.

FLIM-FLAM, n. *flĭm-flăm* [a word imitative of the flapping of a loose texture in the wind: Ger. *flimmen*, to gleam; *flimmern*, to glitter, to sparkle]: something made to catch the eye, but having no solidity or substance; a light insignificant thing; mere show and glitter; a trifle; a whim; a freak.

FLIMSY, a. *flĭm'zĭ* [a probable corruption of the imitative word *flim-flam*, idle talk, a trifle: prov. Sw. *flasma*, a scale or splinter: prov. Dan. *flims*, skin of boiled milk: comp. W. *llymsi*, sluggish, spiritless]: denoting something showy and unsubstantial; without solidity, strength, or force; thin or loose of texture; shallow. FLIM'SILY, ad. *-lĭ*. FLIM'SINESS, n. thinness and weakness in texture; want of solidity. *Note.*—It has been suggested that *flimsy* may be a simple adaptation of *film*, thus *film-sy*.—SYN. of 'flimsy': superficial; vain; empty; unsubstantial; weak; feeble; light; slight.

FLINCH, v. *flĭnsh* [a nasalized form of *flick:* OF. *flechir*, to bend, to go on one side: Ger. *flink*, smart, brisk: Dut. *flinkeren*, to glitter, to twinkle]: to shrink or draw back, as from pain, suffering, danger, or duty; to fail. **Flinch'ing**, imp.: N. a shrinking or drawing back under pain or difficulty **Flinched**, pp. *flĭnsht.* **Flinch'er**, n. one who. **Flinch'ingly**, ad. *-lĭ.*

FLINDERS, *flĭn'dėrz*, **Matthew**: 1774–1814, July 19; b. Donington, Lincolnshire: adventurous English navigator, to whom was due the earliest correct knowledge of a great portion of the Australian coasts. He entered the merchant service at an early age, and subsequently the royal navy. In 1795, the vessel in which he was midshipman conveyed the gov. of New Holland to Botany Bay; and while there, F. determined to investigate the coast s. of Port Jackson, about 250 leagues of which were laid down in the charts as 'unknown.' With an equally daring and ambitious young surgeon in his ship, named Bass, he departed on the enterprise in a small decked vessel, with a crew of only six men. Their chief discovery was the straits between Van Diemen's Land (now Tasmania) and the mainland of Australia, which were named after Bass. In 1801, F. obtained from the British govt. the command of a scientific expedition for the investigation of the Australian coasts and their products. Commencing his examination at Cape Leuwin, F., in the course of two years, gradually explored the coast to Bass's Straits, thence northward—laying down carefully the Great Barrier Reefs—to the Gulf of Carpentaria, which he thoroughly surveyed across to Timur, then back to Cape Leuwin, and round the s. coast to Port Jackson. In 1810 he was liberated from a six years' imprisonment by the French in the Isle of France, returned to England, and gave the world the result of his researches in a work, entitled *A Voyage to Terra Australia.* He died on the day on which his book was published.

FLINDERSIA, n. *flĭn-dėr'zĭ-a* [named after Capt. M. *Flinders*, R.N., who, accompanied by Robert Brown, botanist, explored the coast of Australia at the beginning of the present century]: genus of *Cedrelaceæ*, tribe *Cedreleæ.* A tree growing in Australia and the Moluccas, with wood little inferior to that of mahogany. The fruit, which is thickly covered outside with sharp pointed tubercles, is used by natives of the Moluccas for rasps to prepare roots for food.

FLIN'DERS LAND: now South Australia (q.v.).

FLING, v. *flĭng* [Icel. *fleygia*, to cast, to fling: Norw. *flengja*, to tear to pieces: Sw. *flinga*, a fragment; *flänga*, to use violent action]: to cast or throw from the hand; to throw or hurl; to flounce: N. a throw; a cast from the hand; a sneer or sarcasm. **Fling'ing**, imp. **Flung**, pt. and pp. *flŭng*, did fling. **Fling'er**, n. one who. **Flinging-tree**, piece of timber hung by way of partition between two horses in a stable. To **fling away**, to waste, as means; to neglect, as opportunities; in *OE.*, to dismiss. To **fling down**, to demolish; to ruin. To **fling out**, to throw out, as the legs, or words incautiously; in *OE.*, to grow unruly. To **fling up**, to relinquish or give up. To **have one's fling**, to enjoy one's self to the full. **Highland fling**, a dance of the Scottish Highlanders—the name may be a corruption of *heel and fling*, terms thoroughly descriptive of the character of the movements.

FLINT, n. *flĭnt* [Ger. *flins* and *flinten-stein*, flint: Dan. *flise*, to split: Icel. *fleinn;* AS. *flan*, an arrow, a dart: Dan. *flint;* Sw. *flinta*, a brick]: a very hard species of stone, generally in nodules and concretions; impure silica; anything very hard. FLINT'Y, a. -*ĭ*, like flint; hard; obdurate. FLINT'INESS, n. FLINT-GLASS, the fine bright glass used in making decanters, wine-glasses, etc., made from silica, potash, and oxide of lead (see GLASS). FLINT-HEARTED, having a very hard heart; *figuratively*, hard as flint; cruel. FLINT-WORKER, term applied to those men of the palæolithic period, who fashioned the flint implements found in the drift; a man of any savage race that has not yet emerged from the Stone period and attained a knowledge of the use of metals. FLINTY SLATE, an impure quartz, assuming a slaty structure; containing about 75 per cent. of silica, the remainder being lime, magnesia, oxide of iron, etc. Its fracture is rather splintery than shell-like. It is more or less translucent. It passes by insensible gradations into clay-slate, with which it is often in intimate geological connection. Lydian Stone (q.v.) is a variety of it.

FLINT: river of Georgia, uniting on its right with the Chattahoochee, at the s.w. angle of the state, to form the Appalachicola, which, after a course of 100 m., enters the Gulf of Mexico. The F. itself is about 300 m. long, being navigable for steamboats up to Albany, about 250 m. from the sea.

FLINT: city, cap. Genesee co., Mich.; on F. river and the F. and Pere Marquette, and the Chicago and Lake Huron railroads; 34 m. s.s.e. of E. Saginaw, 64 m. n.n.w. of Detroit, 66 m. w. of Port Huron. It is prettily laid out on both sides the river, has broad, regular and well-shaded streets, is lighted with gas and electricity, and provided with ample water, sewage, and fire department system. The public buildings include a handsome brick court-house, co. jail chiefly of iron, city hall of brick, high-school building that cost $150,000, state institution for the education of the deaf, dumb, and blind, masonic temple, and the structures on the fair grounds of the Genesee co. agricultural soc. There are 8 churches, 1 national bank (cap. $150,000), 1 state bank (cap. $100,000), and 5 weekly newspapers. The industries are represented by 10 saw mills (capacity 100,000,000 ft. annually), 3 breweries, 3 brickyards, 2 flouring mills, paper mill, and manufactories of mill and steam machinery, farming implements, furniture, carriages, and woolen goods. F. was settled 1830, incorporated 1855, and enlarged by annexation 1871. Pop. (1870) 5,386; (1880) 8,409; (1884) 9,017; (1890) 9,803; (1900) 13,103.

FLINT: parliamentary borough and seaport in the e. of Flintshire, N. Wales, formerly cap. of the county, on the left side of the estuary of the Dee, 191 m. n.w. of London by rail, 12½ m. n.w. of Chester. It forms a rectangle like a Roman camp, and is surrounded by now nearly obliterated ramparts and intrenchments. The Dee estuary is some miles wide here, but shallow and narrow at low water. Vessels of 300 tons reach the town. The principal exports are coal and lead from mines in the vicinity, which afford the chief employment. Roman relics and traces of Roman lead smelting-works have been found here. On a low freestone rock in a tidal marsh are the remains of a castle, built by Henry II, and dismantled 1647. The double tower or keep is 40 ft. in diameter, and includes two concentric walls, each 6 ft. thick, with an intervening gallery 8 ft. broad; within, is a circle 20 ft. in diameter, with four entrances. Deterioration of the channel of the Dee has made F. in a great degree a port of Chester, and here larger vessels, especially with timber, are discharged, and the cargoes floated up the Dee in smaller vessels, the timber in rafts. Pop. of F. (1891) 5,247.

FLINT: a mineral which may be regarded as a variety of quartz, or as intermediate between quartz and opal, consisting almost entirely of silica, with a very little lime, oxide of iron, water, carbon, and sometimes even traces of organic matter. It has a flat shell-like fracture, is translucent or semi-transparent, and varies in color from a very dark brown, or almost black, to light brown, red, yellow, and grayish white, and is sometimes veined, clouded, marbled, or spotted. Dark colored flints are most frequent in the chalk, in which principally F. occurs imbedded, forming nodules of various sizes, sometimes large nodular masses, of irregular, often grotesque shape; but gravel formed of light-colored flints is very common, and it is disputed whether or not a change of color has taken place by exposure to atmospheric and other chemical agencies. F. is found sometimes in beds or veins. It is very abundant wherever the chalk formation extends, in England and other countries; rolled F. nodules are often found also in compound rocks, and vast alluvial tracts are sometimes full of them. F. geodes often contain crystals of quartz. F. nodules are usually moist in the interior if broken when newly taken from their beds. F. is sometimes harder than quartz, sufficiently so to scratch it. The readiness with which it strikes fire with steel is well known, and it seems that the sparks are not all merely incandescent particles, heated by the friction, but that in some of them a chemical combination of silica and iron takes place, causing great increase of heat. The use of the F. and steel for igniting tinder, formerly common, has been almost superseded by that of lucifer-matches, and gun-flints have given place to percussion caps. According to Pliny, Clias was the first who struck fire with flint; or more probably, he was the first to show its application to useful purposes; and he therefore received the name *Pyrodes.* The most ancient use of F. was probably for sharp weapons and cutting instruments; and F. knives, axes, arrow heads, etc., are among the most interesting relics of rude antiquity: see FLINT IMPLEMENTS. At present, a principal use of F. is in the manufacture of fine earthenware, into the composition of which it enters, being for this purpose first calcined, then thrown into cold water and afterwards powdered.

The origin of F. is a difficult question. Silicious deposits are sometimes a purely chemical operation, as in the case of the silicious sinter formed round the geysers of Iceland, from the evaporation of water largely charged with silex. But at the bottom of the sea, as no evaporation could take place, some other agent than springs of water saturated with silex must have supplied the materials. It is a fact of considerable importance in this inquiry, that almost all large masses of limestone have thin silicious concretions, or flints. Thus, chert is found in carboniferous and other limestones, and menilite in the tertiary limestones of the Paris basin. The conditions necessary for the deposition of calcareous strata seem to be those required for the formation of silicious concretions. The materials of both exist in solution in sea-water, and as it needed the foraminifer, the coral, and the mollusk to fix the carbonate of lime which formed the chalk deposits, so the silex was secreted by innumerable diatoms and sponges, and their remains most probably supplied the material of the flint. The discovery by Dr. Bowerbank and other microscopists of the spicules of sponges and the frustules of diatoms in almost every specimen of F., has clearly shown that F. to a large extent, if not entirely, owes its origin to these minute organisms. It is, however, difficult to account for the changes that have taken place in these materials subsequent to their deposition.

FLINT, Austin, M.D., LL.D.: 1812, Oct. 20—1886, Mar. 13; b. Petersham, Mass.: physician and author. He graduated in the medical dept. of Harvard Univ. 1833, practiced in Northampton, Boston, and Buffalo, till 1844; was prof. of the institutes and practice of medicine in Rush Medical College, Chicago, 1844–46; established the *Buffalo Medical Journal* 1846, and was a founder of Buffalo Medical College 1847. During 1847–52 he was prof. of the theory and practice of medicine and of clinical medicine at Buffalo, 1852–56 occupied a similar chair in the medical dept. of Louisville Univ., 1856–58 was prof. of pathology and clinical medicine at Buffalo, and 1858–61 (winters) was prof. of clinical medicine in the New Orleans Medical School, and visiting physician to the Charity Hospital. He removed to New York 1859 and became prof. of pathology and practical medicine in the Long Island College Hospital, prof. of the theory and practice of medicine in the medical college of Bellevue Hospital, and visiting physician to the hospital. The former office he held till 1868, the others till death. Subsequently he became consulting physician to the Charity, St. Mary's, and St. Elizabeth's hospitals, and the Hospital for the Ruptured and Crippled. He was pres. of the New York Acad. of Medicine 1872–85, pres. of the American Medical Assoc. 1884, and delegate to the medical congresses, Philadelphia (international) 1876, London 1881, and Copenhagen 1884; and had been elected pres. of the one to be held in Washington 1887. He was author of many standard professional works.

FLINT, Austin, Jr., M.D.: prof. and author; b. Northampton, Mass., 1836, Mar. 28. He studied at Buffalo, Harvard Univ., Louisville, and Philadelphia, and graduated at the Jefferson Medical College, Philadelphia, 1857. He became an attending surgeon in the Buffalo City Hospital and prof. of physiology in the medical college there 1858, removed to New York with his father 1859, and was elected prof. of physiology in the New York Medical College and the New Orleans School of Medicine. He passed a part of 1861 in special study with Charles Robin and Claude Bernard in Paris, and in the same year was elected prof. of physiology and microscopic anatomy in the new medical college of Bellevue Hospital, and sec. and treas. of the faculty. Dr. F. lectured on physiology in the Long Island College Hospital eight years, and was appointed surgeon-gen. of N. Y. 1874. His published works include *The Physiology of Man*, 5 vols. (1866–74); *Manual of Chemical Examination of Urine in Disease* (1870, 84); *Text-book of Human Physiology* (1876, 81); *The Source of Muscular Power* (1878); and *The Physiological Effects of Severe and Protracted Muscular Exercise.* His *A New Excretory Function of the Liver* (1869) received honorable mention and a prize of 1,500 fr. from the French Acad of Sciences.

FLINT, JAMES MILTON: an American naval officer; b. 1838, Feb. 7, Hillsboro, N. H.; educated in common schools and at the Pembroke Academy; was graduated at the Medical Department of Harvard University, 1860, and appointed assistant surgeon, U. S. N., 1862, Apr. 14. He became surgeon, 1874; medical inspector, 1893; medical director, 1897, June 2. He was connected with the U. S. Fish Commission, 1884-87, and at three different periods, in all about 11 years, with the U. S. National Museum. His sea service extended through 11 years and his shore duty through 19 years. He was retired, 1900, Feb. 7, with the rank of rear-admiral.

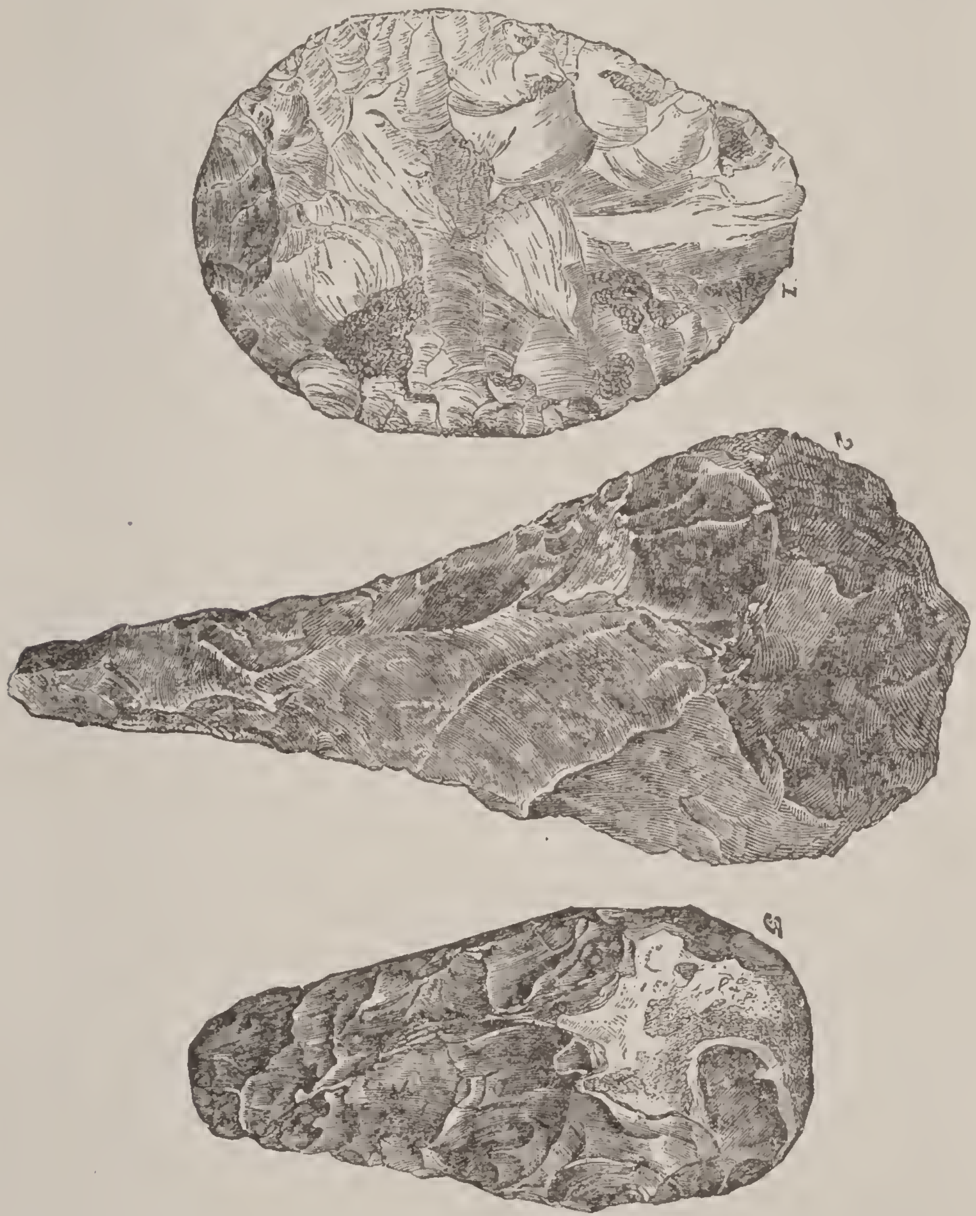
FLINT, TIMOTHY: 1780–1840, Aug. 16; b. Reading, Mass. He graduated at Harvard College, and 1802–14 was minister of the Congl. Church in Lunenburg, Mass. He was a missionary for the valley of the Mississippi, 1815–25. Returning to the northern states, published *Recollections of Ten Years Passed in the Valley of the Mississippi* (Boston, 8vo, 1826); also a novel of adventure in the first Mexican revolution, *Francis Berrian.* In 1828, he issued two works: *A Condensed Geography and History of the Western States in the Mississippi Valley* (Cincinnati, 2 vols. 8vo); and *Arthur Clenning*, a novel (Philadelphia, 2 vols. 8vo). In 1833, he edited several numbers of the *KnickerbockerMagazine*, and was subsequently editor for three years of *The Western Monthly Magazine.* Others of his works, besides novels, are: *Indian Wars in the West* (1833, 12mo), *Lectures on Natural History, Geology, Chemistry, and the Arts* (Boston 1833, 12mo); translation of Droy's *L'Art d'être Heureuse*, with additions by translator; and *Biographical Memoir of Daniel Boone, the First Settler of Kentucky* (Cincinnati 1834, 18mo). In 1835, he contributed to the London *Athenaeum* a series of Sketches of the Literature of the United States. He died at Salem.

FLINT IMPLEMENTS: believed to have been used by the primitive inhabitants in very many countries, have from time to time been turned up by the plow, dug out from ancient graves, fortifications, and dwelling-places, or fished up from the beds of lakes and rivers. They do not differ, in any material respect, from the flint implements and weapons still in use among uncivilized tribes in Asia, Africa, America, and the islands of the Pacific Ocean. The weapons of most frequent occurrence are arrow-heads (see ELF-ARROWS), spear-points, dagger-blades, and ax-heads or Celts (q.v.). The more common implements are knives, chisels, rasps, wedges, and thin curved, or semicircular plates, to which the name of 'scrapers' has been given. There is great variety in the size and in the shape, even of articles of the same kind, and equal variety in the amount of skill or labor expended in their manufacture. In some instances, the flint has been roughly fashioned into something like the required form by two or three blows; in others, it has been laboriously chipped into the wished-for shape, often one of some elegance. In yet another class, the flint, after being duly shaped, has been ground smooth, or has even received as high a polish as could be given by a modern lapidary. Examples of all the varieties of flint weapons and implements are in numerous collections in the United States, in the British Museum, in the Museum of the Royal Irish Acad. at Dublin, in the Museum of the Soc. of Antiquaries of Scotland at Edinburgh, and above all, in the Museum of the Royal Soc. of Antiquaries at Copenhagen, which is especially rich in this class of remains. See *Catalogue of the Archæological Museum at Edinburgh in* 1856 (Edin 1859); Wilde's *Catalogue of the Antiquities in the Museum of the Royal Irish Academy* (Dubl. 1857–61); Worsaae's *Nordiske Oldsager i det Kongelige Museum i Kjobenhavn* (Copen 1859); and Frederic Troyon's *Habitations Lacustres* (Lausanne, 1860).

Geological discoveries have recently invested flint implements with a new interest. At Abbeville, at Amiens, at Paris, and elsewhere on the European continent, flint weapons, fashioned by the hand of man, have been found with remains of extinct species of the elephant, the rhinoceros, and other mammals, in undisturbed beds of those deposits of sand, gravel, and clay to which geologists have given the name of 'the drift.' They resemble the flint implements and weapons found on the surface of the earth, but are generally larger, of ruder workmanship, and less varied in shape. They have been divided into three classes—round pointed, as in fig. 1; and sharp-pointed, as in fig. 2, both being chipped to a sharp edge, so as to cut or pierce only at the pointed end; and oval-shaped, as in fig. 3, with a cutting edge all round. The first and second classes vary in length from about four inches to eight or nine inches; the third class is generally four or five inches long, but specimens have been found of no more than two inches, and of as much as eight or nine inches. In no instance has any flint implement discovered in the drift been found either polished or ground. The French antiquary, M.

Boucher de Perthes, was the first to call attention to these very interesting remains, in his *Antiquités Celtiques et Antédiluviennes* (Paris 1847–57). But it has since been remembered that precisely similar implements were found in a similar position at Hoxne, in Suffolk, England, with remains of some gigantic animal, in 1797; and at Gray's Inn Lane, in London, with remains of an elephant, in 1715.

To what age these remains should be assigned, is a question on which geology seems scarcely yet prepared to speak with authority. But, in the words of Mr. John Evans, in his essay on 'Flint Implements in the Drift,' in the *Archæologia*, xxxviii. (Lond. 1860), 'thus much appears to be established beyond a doubt, that in a period of antiquity remote beyond any of which we have hitherto found traces, this portion of the globe was peopled by man; and that mankind has here witnessed some of those geological changes by which the so-called diluvial beds were deposited. Whether these were the result of some violent rush of



Flint Implements from the Valley of the Somme—Reduced.

waters, such as may have taken place when "the fountains of the great deep were broken up, and the windows of heaven were opened," or whether of a more gradual action, similar in character to some of those now in operation along the course of our brooks, streams, and rivers, may be matter of dispute. Under any circumstances, this great fact remains indisputable, that at Amiens, land is now 160 ft. above the sea, and 90 ft above the Somme, has, since the existence of man, been submerged under fresh water, and an aqueous deposit from 20 to 30 ft. in thickness, a portion of which, at all events, must have subsided from tranquil water, has been formed upon it; and this, too, has taken place in a country the level of which is now stationary, and the face of which has been little altered since the days when the Gauls and the Romans constructed their sepulchres in the soil overlaying the drift which contains these relics of a far earlier race of men.' See MAN.

FLINT'SHIRE: maritime county of N. Wales, bounded e. by Cheshire and the river Dee, s. and w by Denbighshire, and n. by the Irish Sea. The main portion of the county is 25 m. long by 10 broad, and the larger of the two outlying portions, which lies toward the s.e. of the main part. is 10 m. by 5. F. is the smallest of the Welsh counties, its area being only 169,162 acres, of which $\frac{1}{7}$th is arable. The coast, 20 m. long, is low and sandy, but on the Dee estuary fertile. A hill-range, parallel to the Dee, runs through the length of the county, and rises in Garreg to 825 ft. Another range along the s.w. border of the county rises in Moel Famma, 1,845 ft. The chief rivers are the Dee, Alyn, and Clwyd. The chief strata are Permian, Carboniferous, and Devonian. Coal, and ores of iron, lead, silver, copper, and zinc are the chief mineral products and exports. 3,198 tons of lead were raised in 1880 from 34 mines. The soil is fertile in the plains and vales. In 1880, the total acreage under all kinds of crops, bare fallow, and grass was 128,738, of which 9,693 acres were under wheat, 10,797 under oats, and 7,722 under barley. Cotton is the main manufacture. The London, Chester, and Holyhead railway skirts the e. and n. shores. F. sends two members to parliament. The chief towns are Flint, formerly the county town; Mold, St. Asaph, Holywell, Rhyddlan, and Hawarden. F. has traces of Roman lead-mines, is traversed by Wat and Offa's Dykes, and has some ancient castle and ecclesiastical ruins. In F., in the 7th c., Saxon invaders massacred 1,200 Christian monks of the monastery of Bangor. In 796, the Saxons defeated the Welsh here with dreadful slaughter, which event gave rise to the still popular air of *Morfa Rhyddlan*. Pop. of F. (1901) 81,490.

FLIP, n. *flip* [imitative of a smart blow with something thin and flexible (see FLIPPANT)]: a stimulant composed of spirits, ale, sugar, spices, etc., drunk hot.

FLIPPANT, a. *flip'pănt* [Icel. *fleipr*, tattle; *fleipinn*, flippant, pert]: heedlessly talkative; fluent and rapid in speech; pert. FLIP'PANTLY, ad. *-lĭ*. FLIP'PANCY, n. *-păn-sĭ*, fluency of speech; heedless pertness.

FLIPPER, n. *flĭp'ėr:* broad fin of a fish; the arm of a seal; the paddle of a sea-turtle.

FLIRT, v. *flėrt* [Bav. *flitschen*, to flap, to flutter; *flitschen*, a young girl: W. *ffrit*, a sudden start or jerk; *ffritten*, a flighty female]: to run and dart about; to coquet with men; to act with giddiness; to toss or throw with a jerk: N. a darting motion; a pert giddy girl; a coquette: ADJ. in *OE.*, pert; wanton. FLIRT'ING, imp.: ADJ. jerking; darting about; giddy, coquettish. FLIRT'ED, pp. FLIRTATION, n. *flėr-tā'shŭn*, act of flirting; desire of attracting the notice and admiration of men; coquetry. FLIRT'INGLY, ad. *-lĭ.*

FLISK, v. *flĭsk* [imitative of the sound of a cut with a switch]: to flick with a whip; to skip; to bounce. FLISK'ING, imp. FLISKED, pp. *fliskt.*

FLIT, v. *flĭt* [Dan. *flytte;* Sw. *flytta*, to remove: Low Ger. *flitzen*, to move rapidly: Icel. *flytja*, to carry, to cause to flit: Bav. *fletzen*, to change one's abode]: to fly about with rapid motion; to dart along; to flutter on the wing; to remove; to migrate: ADJ. in *OE.*, swift; quick. FLIT'TING, imp.: N. a flying with celerity; a fluttering; in *Scot.*, a removal from one house to another. FLIT'TED, pp. FLIT'TINGLY, ad. *-lĭ.* FLITTER-MOUSE, same as flicker-mouse.

FLITCH, n. *flĭch* [OF. *fliche*, a flitch of bacon: Icel. *flicki*, a large lump of flesh: Low Ger. *flicken*, a piece]. the side of a hog salted and cured.

FLITE, or FLYTE, v. *flīt* [AS. *flitan*, to scold: O.H.G. *flizan*, to strive, to contend: Icel. *fljotr*, quick, ready; *flyta*, to hurry on]: in *Scot.* and *prov. Eng.*, to quarrel; to scold; to censure severely. FLYT'ING, imp.: N. the act of scolding. FLAYT, pt. and pp. *flăt;* also FLET, pt. and pp.

FLITTERN, n. *flĭt-tėrn* [etym. doubtful]: term applied to the bark of young oak trees, which is more valuable for tanning than that of old trees.

FLOAT, v. *flōt* [AS. *fleotan*, to float: F. *flotter*, to float—from L. *fluctus*, a wave: Icel. *flot*, the act of swimming: *fliot*, a river; *fliotr*, swift (see FLEET 1 and 2)]: to swim on the surface; not to sink; to move lightly and irregularly, as through the air; to cover with water; to give buoyancy to; to set agoing and give a first start to, as to *float* a company: N. anything used to buoy up something else; the cork or quill used on a fishing-line; in *OE.*, *flote* for *float*, a wave. FLOAT'ING, imp.: ADJ. lying on the surface of water, or in air; free or loose to be used as occasion requires, as capital. FLOAT'INGLY, ad. *-lĭ.* FLOAT'ED, pp.: ADJ. made known to the public in order to invite subscribers, said of a loan or a company. FLOAT'ABLE, a. *-ă-bl*, that may be floated. FLOAT'ER, n. *-ėr*, he or that which. FLOAT'ERS, n. plu. *-ėrz*, in *slang*, exchequer bills and unfunded stocks in general. FLOAT'AGE, n. *-āj*, that which floats. FLOATATION, n. also spelled FLOTATION, n. *flō-tā'shŭn*, the act of floating; the science of floating bodies. FLOAT-BRIDGE, a bridge of rafts or boats floating on the water. FLOATING LIGHT, a ship in a fixed posision bearing a light; any floating vessel bearing a light. FLOAT-BOARD, one of the boards of a water-wheel, or of a steamer's paddle-wheels. FLOAT-GOLD, gold so finely crushed that it remains in suspension in the water, and hence is liable to be lost in the ordinary stamp-mill process. FLOAT-ORE, water-worn particles of ore; fragments of vein material found on the surface away from the vein outcrop. FLOAT-STONE, a variety of quartz, consisting of fibres—delicate crystals—aggregated so that the whole mass is sponge-like, and so light, owing to the air confined in the interstices, as to float for a while on water: it is found in a limestone of the chalk formation near Paris, in imbedded masses, or incrusting flint nodules FLOATING DEBT, debt not funded. FLOATING CAPITAL capital employed in business, but of uncertain amount.

FLOATING BATTERY: a hulk, or raft, heavily armed, and made as invulnerable as possible, used in defending harbors, or in attacks on marine fortresses. The most remarkable instance of their employment was by the French and Spaniards against Gibraltar, in the memorable siege, 1779, July—1783, Feb., when ten of these vessels, carrying 212 large guns, were brought to bear on the fortress; they had sides of great thickness, and were covered with sloping roofs, to cause the shot striking them to glance off innocuously. But their solidity and strength did not prevent their destruction with red-hot cannon-balls. Steam floating batteries of iron were constructed for the war with Russia 1854, both by the British and by the French governments; but, they have since been generally discarded for other than purely defensive purposes, as too cumbrous for

Floating Battery used in the Russian War, 1854–1855.

navigation, and too suffocating from the smoke that collected between their decks during action. They are superseded for all purposes of attack and defense by armor-clad vessels, and Turret-ships (q.v.).

FLOATING DOCK: great frame or coffer (or series of coffers) to receive a vessel which is then lifted by it to expose the bottom for repairs. So long as ships were small, repairs on their hulls were effected by the easy method of laying them on any convenient beach or sandbank at high water. The receding tide would leave them high and dry with bottom exposed for a few hours at a time. Even now this plan is frequently resorted to, the beach which is to receive the vessel being laid with parallel rows of timber beams, called collectively a *gridiron*. But the rise and fall of the tides is in many places insufficient to leave the hull dry at low water, and the larger the ship the greater the risk of 'beaching.' Numerous other modes have been adopted. Fig. 1 represents a mode of heeling over ships which was at one time much used. A is a lighter of sufficient size and weight, provided with very powerful 'heaving-down tackle,' consisting of strong ropes, B, passing through very large blocks. These tackles are made fast to the masts of the vessel, which are previously secured by extra stays, on the upper side at D; and then, by working the tackles, the hull of the vessel is heeled over until it assumes the position shown in fig. 1. This plan necessitates the removal of the whole cargo. When there is no rise and fall of tide, the lighter, A, is not required, as the tackle, B, can be made fast to the quay or pier. It was while being careened over that the *Royal George* went down at Spithead, England 1782, with 600 men on board. Graving or Dry Docks (see Dock) offer a very easy plan for repairing ships; but they are always very costly. Another common method is by bringing ships on to sloping ways, called *slips*, carried out from the yard a long distance under water, and then hauling them up on the shore end of the ways by tackle, generally worked by hydraulic power (see Slip). During the operation, the vessel rests upon a suitable carriage.

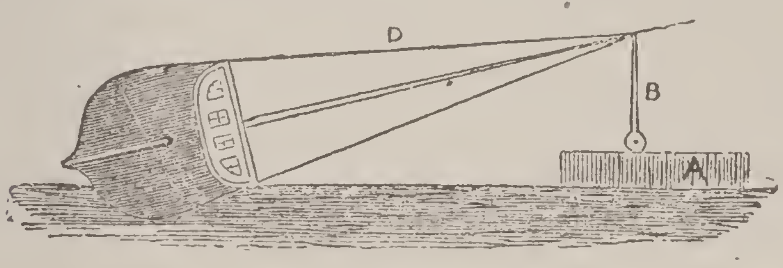


Fig. 1.

Floating docks have been in use for many years: formerly they were of timber in the form of a large box with a flap-door falling down on strong hinge sat one end. They are moored in still water, with a depth just sufficient to allow the vessel to float into them as they rest on the bottom. The flap-door is then raised up, and the water pumped out; whereby the F. D. rises, and lifts the ship. These timber docks were not always efficient or even safe, Many (some in sections), of size sufficient to dock large vessels, have been built in the United States.

Iron is now the material preferred for these constructions. R. W. Thomson, C. E. of Edinburgh, designed 1859 a great iron F. D. for the port of Sourabaya, Java. It consisted of more than 75,000 separate plates, ribs, and angle-irons, every one having been beforehand shaped, punched with numerous holes, and ready in every respect to be riveted into its place. The holes punched numbered two millions. Fig. 2. represents an end view of this dock. The water-tight compartments, A, A′, B, B′, and C, all were completely under the command of the powerful centrifugal steam-pumps, so that they could be separately filled or emptied in a very short time. In fig. 2, the dock is shown heeled over to one side, giving access to its bottom for repairing or cleaning: this tilting over could be accomplished by filling the compartment A′, and emptying all the others. The water-tight compartments were divided in their longitudinal direction into five separate divisions, making in all 25 water-tight compartments, any one of which could be filled or emptied at pleasure; thus affording complete command over the dock, and admitting of its being put into any required level, notwithstanding any irregularity in the distribution of the weight resting on the dock.

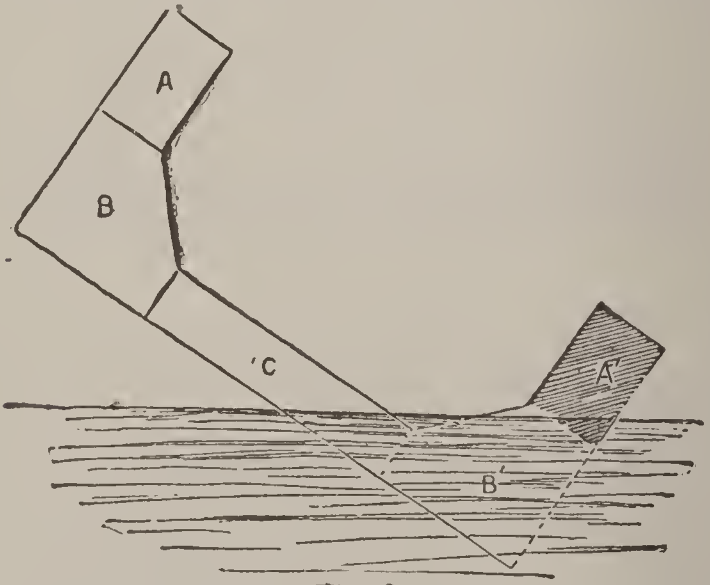


Fig. 2.

F. D.s require engineering skill for their management, and, unless carefully managed, are liable to serious accidents. Some have been wholly lost; one erected at Rio Janeiro proved unmanageable, and was never used; and a fatal disaster occurred in connection with one at Callao. To overcome such disadvantages, Edwin Clark invented the Hydraulic Lift Graving Dock, London. It consists of a pontoon, filled with water, and sunk between two rows of iron columns; and the pontoon, when the vessel has been placed over it, is raised by hydraulic pumps acting on the pontoon by chains. On this, and on Floating Docks, see the *Proceedings of the Inst. of Civil Engineers*, XXV. XXXI

Fig 3, is a view of the dock at Saigon in Cochin China, constructed by the French govt. and put together nearly in the same way as that at Sourabaya. Its performances are in every way satisfactory; it has lifted, high and dry out of the water, the 70 gun frigate, *Persévérante.* As the Callao Dock floats in an open roadstead, some apprehension was felt that the swell would cause too much movement to admit of ships being safely docked, but it has done its work in the most satisfactory way. None of these iron docks have doors or gates for excluding the water. The bottom part is made of sufficient buoyancy to float the vessels clear out of the water, and the equilibrium of the dock is maintained during the time it is under water, for the purpose of admitting a vessel, by the great displacement offered by the hollow sides, AA′ (fig. 2).

One of the most remarkable of recently constructed floating docks was that sent out to St. Thomas (W. Indies) 1867, designed by Frederick J. Bramwell. It is 300 ft. long, 72 ft. wide clear between the sides, and has a double bottom 9 ft. 9 in. deep. The sides are open girders, not hollow boxes, as in the Sourabaya dock, and immense rectangular air-vessels called 'floats,' each about 47 ft. × 11 ft. × 5 ft., are placed between the side girders, and are capable of being moved up and down by screws to preserve the stability of the whole while it is being raised or lowered. By an accident soon after its arrival at St. Thomas, this dock was sunk, and a hurricane which followed close on its sinking, injured it still further. It remained under water for a long time, but was raised to the surface 1871, after operations which lasted a year and a half. The lifting

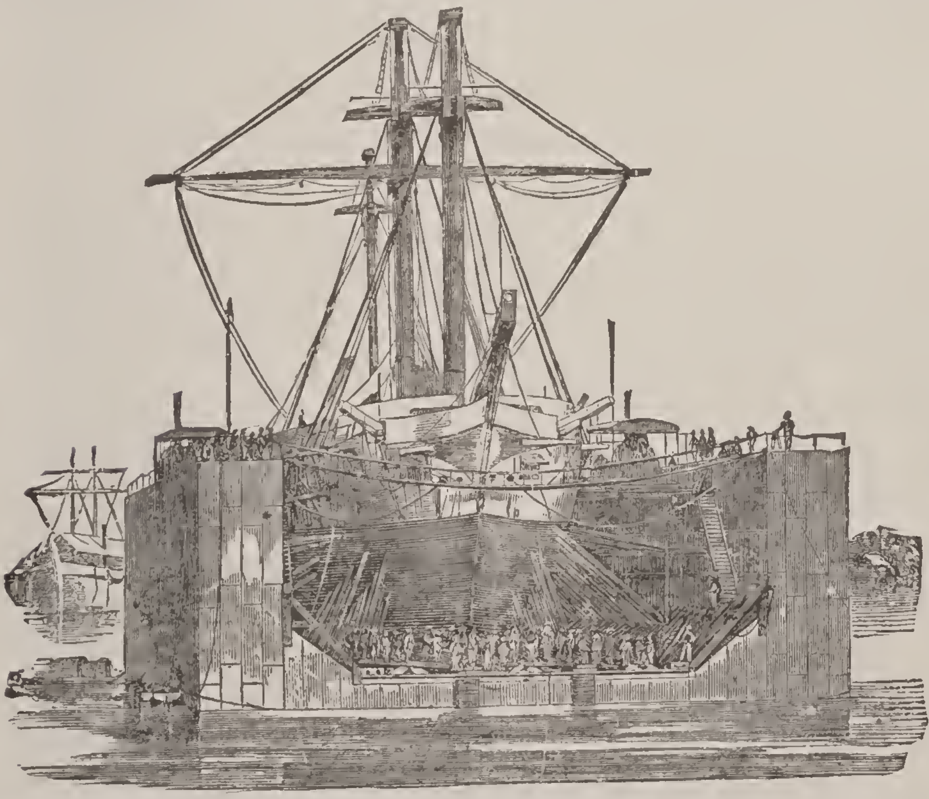


Fig. 3.—Floating-dock at Saigon, with the *Persévérante* of 70 guns. (From a Photograph.)

power of the dock is given at 8,357 tons. A dock sent to Bermuda about the same time, had a lifting power of 16,700 tons, and was 381 ft. long. The docks made by Messrs. Rennie for Cartagena and Ferrol have been very notable and successful. The former weighs about 4,400 tons, and has lifted the Spanish ironclad *Numancia*, weighing 5,600 tons, and supported it for 80 days. It is credited with a total lifting power of 11,500 tons; while that at Ferrol should sustain a weight of no less than 13,040 tons. See DOCK: CAMEL: PONTOON.

FLOATING HOUSES: for examples see BANGKOK.

FLOATING ISL'ANDS: found in some lakes, and more rarely in slow and placid rivers. Some are formed by the detachment or portions of the bank; the interlaced roots of plants forming a fabric sufficiently strong to endure the occasional buffeting of waves, and to support soil for herbage or even trees to grow in. F. I. formed sometimes by aggregation of drift-wood in the creeks and bays of tropical rivers, and wafted into the channel of the river when it is flooded or by the wind, are carried down to the sea, with the soil that has accumulated, and the vegetation that has established itself upon them. They are sometimes seen 50 or 100 m. from the mouth of the Ganges, with living trees standing erect upon them. Portions of the alluvial soil from the deltas of rivers, held together by the roots of mangroves and other trees, are sometimes carried out to sea after typhoons or hurricanes, involving ships in unexpected dangers. Imagination has always invested with a peculiar interest the

> Straggling plots, which to and froe doe rome
> In the wide waters ;

and ancient legend did not fail to notice the floating islets of the sacred Vadimonian Lake, which were large enough to bear away cattle that were tempted upon them by their fresh, green grass ; and the island of the Cutilian waters, which carried on its surface a dark and gloomy grove, and was constantly changing its place. A small lake in Artois, near St. Omer, is remarkable for the number of its floating islands, as are also the marshy lakes of Comacchio near the Gulf of Venice. Among the largest in the world are those of the Lake of Gerdau, in Prussia, which furnish pasturage for 100 head of cattle ; and that of the Lake of Kolk, in Osnabruck, which is covered with beautiful elms. Loch Lomond, in Scotland, was long celebrated for its F. I., which has long since subsided and become stationary. F. I.s are found in some lakes of Scotland and Ireland, and consist mostly of large floating masses of peat. More interesting to the scientific inquirer, as presenting a phenomenon not so easily explained, are those floating islands which from time to time appear and disappear in the same spot, of which there is one in the Lake of Derwentwater in Cumberland, England ; one in the Lake Ralang in the province of Smalande in Sweden ; and one in Ostrogothia. The marshy ground of the vale of Cashmere, and particularly around the city of Cashmere, containing many lakes, and liable to inundations, exhibits a peculiar form of human industry in its numerous FLOATING GARDENS, chiefly for the cultivation of cucumbers, melons, and water-melons. These floating gardens may be described as portions of the marshy ground artificially made to float, by cutting through the roots of the reeds, sedges, and other plants about two ft. below the surface, upon which mud is then spread. The floating of the garden secures the soil and crop from destruction by inundations. Floating gardens are said to have existed on the Lake of Mexico before the Spanish conquest. The Mexicans had made great progress in the art of gardening, particularly in the cultivation of flowers, which were much used in their festivities and in their worship. How they were induced to attempt the formation of floating gardens, and at what period it was first done, are unknown. The shallowness of great part of the lake was favorable to the attempt, and perhaps the gradual receding of its waters may be reckoned among the reasons of the gradual diminution of the number of the floating gardens which have almost ceased to be reckoned among the wonders of the world. The Abbé Clavigero, in his *History of Mexico*, describes them as formed of wicker-work, water-plants, and mud; as sometimes more than 20 poles in extent; the largest commonly having a small tree in the centre, and sometimes a hut for the cultivator; and as employed for the cultivation of flowers and culinary plants. Humboldt confirms this description, but states that the real floating gardens, or *chinampas*, are rapidly diminishing in number. The existing *chinampas* are in general not floating gardens, but plots of ground with very wide ditches between them, formed by heaping up earth from the ditches in the swamps or shallows at the side of the lake. F. I.s at mouths of rivers have an important function recognized in science, in carrying animals and plants from land to land: see Wallace's *Island Life* (1880).

FLOATING WAREHOUSES: magazines for storage on water of petroleum and other dangerously inflammable and explosive chemicals. Such constructions are used in France, and can be moored at a distance from buildings on land, and can be towed as desired. These were made of hollow iron cylinders, placed upright in four rows of 25 each, all lashed together, to form a raft. Each cylinder was designed to contain 25 tons of material.

FLOATSAM: see under FLOTAGE.

FLOBECQ, *flō-bĕk':* small town of Belgium, province of Hainault, 20 m. n.e. of Tournai. It has extensive manufactures of linens, has breweries, salt-works, oil and flour mills, and has two fairs annually. Pop. 6,000.

FLOCCILLATION, n. *flŏk'sĭl-lā'shŭn* [L. *floccŭlus*, a small lock of wool—from *floccus*, a lock of wool (see FLOCK)]: a picking of bed-clothes by a sick person, an alarming symptom. FLOCCOSE, a. *flŏk-kōs'*, in *bot.*, covered with wood-like tufts. FLOCCOSE'LY, ad. *-lĭ*, in a tufted manner. FLOCCULENT, a. *flŏk'kū-lĕnt*, coalescing and adhering in flocks or flakes: having the appearance of flocks or flakes. Floc'culence, n. *-lĕns*, the state of being flocculent. Flocculus, n. *-lŭs*, in *anat.*, the subpeduncular lobe on the under surface of the cerebellum. Floccus, n. *flŏk'kŭs*, Flocci, n. plu. *flŏk-sī*, in *bot.*, woolly filaments like hairs or threads; a tuft of hair terminating a tail.

FLOCK, n. *flŏk* [Icel. *flokkr;* Dan. *flok;* Sw. *flock*, a flock: L. *floccus;* It. *flocco;* F. *floc*, a lock or flock of wool: Norw. *flokk*, a heap, a collection, a family; *flokje*, a knot, a bunch: AS. *floc*, a flight]: a company or collection, as of sheep or birds; a lock or flake of wool; a Christian congregation in relation to their pastor; V. to gather in flocks or crowds; to crowd together. Flock'ing, imp. Flocked, pp. *flŏkt.* Flocky, a. *flŏk'ĭ*, abounding with flocks or little woolly tufts. Flocks, or Locks, material for mattresses and beds, consisting of the waste wool thrown off in the process of manufacture. *Note.*—Both in this and the preceding entry the primary idea seems to be 'a coherent mass, a heap, a collection.'

FLODDEN, *flŏd'dĕn*, Battle of: between James IV. of Scotland, and the Earl of Surrey, of England, 1513, Sep. 9. A 'perpetual peace' had been concluded between England and Scotland, 1502, Jan. 24. In a few years a series of petty quarrels had weakened this peaceable arrangement; and in 1513, on the invasion of France, Scotland's ancient ally, by Henry VIII. of England, a war broke out between the two countries. James IV., the chivalrous but rash king of Scotland, summoned the whole array of his kingdom to meet on the Borough or Common Moor of Edinburgh, which extended from the s. walls of the city to the foot of the Braid Hills, and which was then 'a field spacious, and delightful by the shade of many stately and aged oaks.' Here an army, it is said, of 100,000 men assembled. With this force James crossed the border 1513, Aug. 22; but instead of advancing at once, and achieving a decisive success, he lingered in the neighborhood of the Tweed until his army had become reduced by desertion to about 30,000 men. On Sep. 6 James took up his position on Flodden Hill, the last and lowest eminence of the Cheviots toward the n.e. On the morning of the 9th, the Earl of Surrey, lieut.gen. of the northern counties of England, at the head of an army of about 32,000 men, advanced from the s.e., crossed the Till by a skilful and unexpected movement, and thus cut off all communication between King James and Scotland. While the English were crossing the Till, the Scots might have attacked them with every chance of success; their neglect of this opportunity was the first great mistake of the battle. Observing that the English were aiming at a strong position n.w. of Flodden Hill, James, having ordered his tents to be set on fire, advanced against them in battle-array. The two armies were drawn up in similar order, each consisting of a centre, a right and left wing, and a reserve behind the centre. At about four o'clock on Friday, Sep. 9, the battle commenced with cannonading on both sides. The Earls of Huntly and Home, who commanded the left wing of the Scottish army, charged the English right, led by Sir Edmund Howard, and entirely defeated it. Instead of following up their success, Home's borderers commenced pillaging the baggage of both armies; and Huntly, after his first charge, is said to have left the field. On the Scottish right, the clansmen under Lennox and Argyle, goaded to fury by the English archers, rushed forward, heedless of order, and fell with the greatest violence upon their opponents, who, however, received them with wonderful intrepidity and coolness, and at length put them to flight with great slaughter. Meantime, a desperate resistance was being made by the Scottish centre, where the king fought on foot among his nobles. Scottish history presents no instance in which the national valor burned with a brighter flame than in this. Hemmed in by outnumbering enemies, the king among his slender group of lords fought manfully until, when the night was closing on Flodden, he fell pierced by an arrow, and mortally wounded in the head. The hill was held during the night by the Scots; but at dawn, learning the state of matters, they abandoned their position. Their loss was from 8,000 to 10,000 men. 'Scarce a Scottish family of eminence,' says Scott, 'but had an ancestor killed at Flodden.' Besides the king, the Abp. of St. Andrews and 12 earls were among the slain. The English loss amounted to 6,000 or 7,000; but Surrey's victory was so nearly a defeat that he was unable to prosecute the war with any vigor. The sixth canto of Sir Walter Scott's poem of *Marmion* contains a magnificent, and in the main accurate, description of the battle.

FLODOARD, *flo-do-âr'*, or FRODOART *fro-do-âr'*: 894–966; b. Epernay, France: chronicler. He was educated for the priesthood at Rheims, became canon in the cathedral there, was imprisoned for opposing the interference of the civil power with the affairs of the church; and spent the latter part of his life in study and writing in a monastery of which he had been appointed abbot. His works comprise *Histoire de l'eglise de Rheims; Chronique Sacrée*, a poetical history of Jesus Christ and leaders in the church; and *Chronicon Rerum inter Francos gestarum*, an invaluable chronicle of events in France 919–966.

FLOE, n. *flō* [Icel. *flaga*, what separates as a splinter; Icel. *flot*, what swims on the surface (see FLAG 4]: a low flat mass or collection of floating ice in the ocean.

FLOETZ, a. *flĕts* [Ger. *flötz*, a layer or stratum]: in *geol.*, in flat horizontal beds.

FLOG, v. *flŏg*, [imitative of the sound of a blow: L. *flagel'lum*, a scourge: Low Ger. *flogger*, a flail]: to beat; to whip; to lash. FLOG'GING, imp.: N. a whipping, as a punishment. FLOGGED, pp. *flŏgd*.

FLOG'GING, ARMY AND NAVY: form of corporal punishment from time immemorial in the British army and navy; formerly inflicted on slight occasion, and often with barbarous severity; abolished 1881. When a soldier on active service is now guilty of a punishable offense, he is awarded such summary punishment, other than flogging, as may be directed by rules made from time to time by one of her majesty's principal secretaries of state; and such summary punishment is to be of the character of personal restraint or of hard labor, but not of a nature to cause injury to life or limb, and is not to be inflicted when imprisonment can be employed with due regard to the public service. A few capital offenses, in the military service of all countries, are punishable with death.

In the French army corporal punishment is not recognized, as French soldiers are drawn from all ranks of society, and have on an average, a higher moral tone than the British recruits, who volunteer usually from the lowest orders. On the other hand, the discipline in the French army, and especially during war on a foreign soil, is admitted to be inferior to the strict rule among British troops. The French soldier, though escaping the ignominy of personal chastisement, is governed by a code harsher than British army regulations as actually administered; and the punishment of death, scarcely known in the British or the United States service during peace, is not unfrequently visited in France upon offenders against discipline.

In the U. S. army and navy, flogging was long ago discontinued. The discipline and penalties are generally similar to those in the British service.

FLOOD, n. *flŭd* [Goth. *flodus;* Icel. *flod;* Sw. *flod,* a flowing water: Icel. *flœda;* Sw. *floda,* to inundate]: a great flow of water; a body of water overflowing land, as from a river; abundance: V. to deluge; to overflow. **FLOOD'ING,** imp. overflowing: N. an extraordinary uterine flow of blood. **FLOOD'ED,** pp. **FLOOD-TIDE,** the rise and flow of the tide. **THE FLOOD,** the great deluge in the time of Noah. **FLOOD-GATE,** a gate to be opened for the flow of water, or to be shut to prevent its flow. **FLOOD-MARK,** the line to which the tide rises. **FLOOD-PLAIN,** land along a stream, so little higher than the usual level of the water as to be often overflowed and thereby slowly raised by the deposits made.

Floods in History.—The following list comprises the most notable floods:

1396. Holland; islands of Texel, Vlieland, and Wieringen separated from mainland, and Marsdiep, the channel between Texel and North Holland, formed.

1421 or 1446. Holland; 72 villages inundated, of which 20 permanently, about 100,000 persons drowned, Biebosch formed E. of Dordrecht, and this town separated from mainland.

FLOOD.

1521. Holland; 100,000 lives lost by an inundation.

1570. Holland; storm drove in the sea, destroying numerous villages and 20,000 people in Friesland.

1617. Catalonia, Spain; 15,000 perished in floods.

1629. Mexico (city) inundated.

1642. China, at Kaifong; 300,000 drowned.

1646. Holland and Friesland inundated; loss of life, 110,000.

1726. Floods and inundations all over Europe.

1745. Peru; Callao destroyed by irruption of sea caused by earthquakes.

1767. England; irruption of sea on E. coast.

1782. Formosa; w. side of island submerged, and Taiwan destroyed.

1787-1788. India, in northwestern provinces and Punjab; 15,000 lives lost by floods.

1791. Cuba; floods from excessive rain; 3,000 drowned.

1811. Hungary; 24 villages swept away by overflow of Danube.

1813. Austria, Hungary, Poland, and Prussian Silesia; floods caused by rains; 4,000 perished in Poland, 6,000 in Silesia.

1816. Germany; Vistula overflowed; great loss of life and property.

1819. England; 5,000 acres deluged in the Fen counties.

1824. St. Petersburg and Cronstadt; 10,000 lives lost from overflow of Neva.

1825. Denmark; sea broke through from North Sea to Limfjord, making northern Jutland an island; one-third of Friesland submerged by rising of sea and rivers.

1829. Germany; dikes of the Vistula broke at Danzig, destroying many lives and much property.

1830. Vienna; dwellings of 50,000 under water.

1833. China, Canton; inundations from incessant rains; similar calamity in other parts of China.

1840. France; overflow of Saone and Rhone, swept away many villages and inundatel Lyons, Avignon, Nimes Marseilles, etc.

1846. France; inundations in the center and s.w.

1849. New Orleans, La.; great inundation; 1,600 houses flooded.

1851. Northern China; Yellow river burst its banks, and made a new outlet into Gulf of Pechili.

1852. Floods throughout Europe from Belgium to Switzerland.

1856. S. of France; floods did damage to extent of $28,000,000.

1864. Sheffield; bursting of the Bradfield reservoir; about 250 drowned.

1866. England, Yorkshire, Lancashire, Derbyshire, Leeds, Manchester, Preston, Wakefield; many lives lost.

1868. Peru; Arica and Iquique nearly destroyed by earthquake waves.

1874. Mill river valley (Massachusetts) inundated by bursting of a dam; 144 drowned. Also floods in western Pennsylvania; 220 drowned and in Eureka, Nevada; through rain and a waterspout.

1875. Disastrous floods throughout central Europe, in the United States, Burma, India, and West Indies.

1876. China; floods in northern provinces; in Bengal 200,000 persons perished from inundation of a tidal wave.

1879. Hungary, Szegedin; bursting of the dams of the Theiss; town nearly destroyed; 77 drowned; also in Spain, Murcia; floods from excessive rains; 1,000 drowned; and in Iowa, Kansas, Minnesota, and Missouri.

1881. Ohio and Mississippi valleys flooded; many drowned.

1883. Java and Sumatra; parts submerged by volcanic wave. Also floods in Cincinnati, Kentucky, Ohio, and Pennsylvania.

1886. New England, New York and Pennsylvania; great loss of property; also in Galveston, Tex.

1887. China; the Hoang-ho in Ho-nan; millions of lives lost.

1889. Johnstown, Pa.; reservoir burst; 2,209 lives lost.

1891. Consuegra, Spain; 1,200 lives lost.

1893. Queensland; great destruction of property.

1900. Galveston, Tex.; 7,000 lives and $30,000,000 of property lost, from hurricane and flood.

1901. West Virginia; cloudburst and great destruction of life and property.

1903. Great rising of the Kansas, Missouri, Mississippi and Des Moines rivers; Kansas City, Topeka, Des Moines and other cities inundated; loss of life over 300; loss of property about $10,000,000.

FLOOD, *flŭd*, HENRY: Irish politician and orator: 1732—1791, Dec. 2; son of a chief justice. He studied at Dublin and Oxford, and soon obtained a seat in the Irish parliament. He was a powerful and effective speaker, and was made a privy councilor. This and his public offices he resigned, to devote himself to the popular party. He aimed at a higher degree of Irish independence than even Grattan demanded, with whom he quarrelled seriously. In 1783, F. sat for Winchester in the English house of commons.

FLOOK, n. *flôk* [Ger. *fluhen* and *anker-fliegen*, the flooks of an anchor—from Bav. *flug;* Low Ger. *flunke*, a wing: Dan. *flig*, a flap]: that part of an anchor which catches the ground, generally spelled FLUKE.

FLOOKEN, n., or FLUKAN, n. *flôk'ăn:* a miner's term for a soft clayey substance occasionally found in cross-courses and slides. FLOOK'ING, n. same meaning.

FLOOR, n. *flōr* [AS. *flor;* Dut. *vloere,* a floor: Ger. *flur,* a tract of flat country: W. *llawr,* the ground: L. *lar,* a hearth]: that part of a house or room on which we walk; a story; a series of rooms on the same level: V. to lay with a floor; to knock down; to silence an opponent. FLOOR'ING, imp.: N. a platform; pavement; material for floors. FLOORED, pp. *flōrd, colloquially,* overcome or exhausted, as by trouble or fatigue. FLOOR'ER, n. *-ėr,* a blow which knocks down; an argument or question which stuns or silences. FLOOR'LESS, a. without a floor.

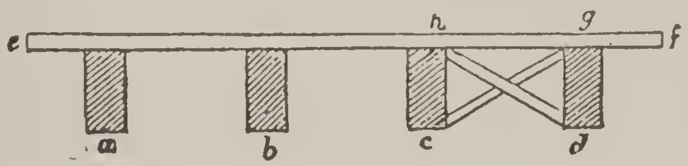
FLOOR-CLOTH (in the United States called usually OIL-CLOTH): coarse canvas coated on both sides, and partly saturated with thick oil-paint, one side having usually a colored pattern printed in oil-paint. The canvas basis is required to be without seam, and of sufficient width to cover considerable spaces of flooring; hence special looms are required for weaving it. It is 18 to 24 ft. in width, and in lengths 100 to 113 yards. The first step toward converting this canvas into floor-cloth consists in stretching it on a frame, sometimes 100 ft. in length by 24 ft in height, over which the canvas must be stretched as tight as a drum. The back or plain side of the cloth is first operated upon, by *priming* it with a solution of size, and scouring it with pumice. The object of this is to prevent too much of the paint from penetrating the canvas, and rendering it brittle, and to make an even surface to receive the paint, which is mixed with linseed oil, with very little or no turpentine, and is consequently thicker than common paint. This is thrown or splashed upon the surface with a brush; and then with a long steel trowel the workman spreads the dabs of paint, and produces a moderately smooth surface. This *trowel-color* is left for 12 or 14 days to dry, and then another coat is laid on in a similar manner; and this completes the back or under side of the floor-cloth. While the first coat of the back is drying, the front is *primed* and pumiced, and a coat of trowel-color laid on. As more care is required on this side, this coat of color is scoured quite smooth with pumice, and two more trowel-colors are added, and each scoured like the first. Another coat is now carefully laid on with a brush, and is called a *brush color.* This forms the ground on which the pattern is to b printed.

The printing is done by means of wood-blocks. The pattern is first drawn and painted, in its complete form and colors, upon a piece of paper; another piece of paper is laid under this, and the outlines of that portion of the pattern included in one color are pricked through to the lower paper. In like manner, pricked outlines of each of the other colors are prepared. Each of these pricked sheets is laid upon a block of pear-tree wood, and dusted over with powdered charcoal or lampblack, and thus the pattern is drawn in dots upon the wood; the carver cuts away the wood surrounding the pattern, and leaves it standing in relief. The pear-tree blocks are backed by gluing them to a piece of deal, and this piece again to another, with the fibres at right angles, to prevent warping. The colors are spread by boys upon padded cushions covered with floor-cloth, and each printer dabs his block upon that containing the required color, and then places it upon the floor-cloth, and striking it with the handle of a short heavy hammer, prints his portion of the pattern. He proceeds with a repetition of this, and as he advances, he is followed in order by the printers of the other colors, who place their blocks accurately over the pattern the first has commenced. The first printer's chief care is to keep the repetitions of the pattern accurately in line.—The quality of F. C. depends mainly on the number of coats of paint, the kind of medium used for the color, and the time given to drying. For the best qualities, a fortnight must elapse between the laying on of each coat; and finally, several months' exposure in the drying-room is necessary. As the rental of the space thus occupied, and the interest of the capital left stagnant during this time, amount to a considerable sum, there is a strong inducement to manufacturers to hasten the processes, which may easily be done by using gold size or boiled linseed oil, or other rapid 'dryers,' instead of raw linseed oil; but in proportion as the drying is hastened by these means, the durability and flexibility of the F. C are decreased. To secure the maximum of durability, F. C. should still be kept three or four years after it has left the drying-room of the manufacturer, and purchasers should always select those pieces which they have reason to believe have been longest in stock. Narrow F. C., for stair-carpeting, passages, etc., is made as above, and then cut into the required widths, and printed. It usually has a large pattern in the middle, and a border of a smaller design

The laying of lobbies and passages with encaustic tiles has led to the superseding of F C. in such situations, while for some other purposes, such as covering the floors of churches, reading-rooms, and waiting-rooms at railway-stations, it is superseded by the material called Kamptulicon (q.v.), or vulcanized india-rubber cloth, impervious to wet, soft and quiet to the tread, and warm to the feet. This material is made plain or figured to resemble painted floor-cloth. See also LINOLEUM.

FLOOR—FLOORING: horizontal partition between the stories of a building, the upper part of which forms the floor of the apartments above, and the lower portion the ceiling of those below. Floors are constructed variously according to their dimensions, and to the weight they have to sustain. *Single-joisted floors* are the simplest and cheapest, and are used for ordinary buildings, where the distance between the bearings does not exceed 20, or at most 24 ft.

The annexed figure represents a section of a single-joisted F. in the line of the flooring-boards, and across the joists. These joists are beams laid edge upward resting at their ends upon wall plates built into the walls. Their width should not be less than two inches, for if narrower, they would be liable to split with the nailing of the flooring-boards. They are placed edge upward to economize timber, as the strength of a beam to bear a transverse strain varies simply with the breadth and with the square of the depth: see STRENGTH OF MATERIALS. When a deep and long joist is used, there is danger of its twisting or turning over; this is prevented by *strutting*, that is, nailing cross pieces of wood between them, as shown between the joists *c* and *d* of the figure, or less effectually, by driving pieces of planking between them. Strutting is required when the length of the joists exceeds eight ft. The laths for the ceiling of the room below are nailed to the bottom of the joists. In good substantial work, the distance between the joists from centre to centre is about 12 inches, but this is often exceeded in cheaply built houses. *Double-joisted floors* are constructed by laying strong timbers, called *binding-joists*, from wall to wall, about six ft. apart; and a double set of joists, one above for the floor, and one below for the ceiling, are laid across these, and notched down upon them. These latter, when thus placed, are called *bridging-joists*, as they bridge over the interval between the larger binding joists. This is adopted when a more perfect ceiling, free from cracks, produced by the yielding of the F. is required, or where there is a difficulty in obtaining a sufficient amount of long timber for single joisting the whole of the floor.—*The framed floor* is one degree more complex than the double-joisted. Binding and bridging joists are used in the framed F. but the binding joists cease to be the primary support, as for this purpose strong balks of timbers, called *girders*, are used. They are laid across, at distances of from eight to ten ft., and the binding-joists are framed into them by a *tusk-tenon* joint: see CARPENTRY. The bridging-joists are notched to these in the same manner as for double-joisted floors. A *bay* is the general name for the space between girders: if between a girder and wall, it is called a *tail bay;* or between two girders, a *case bay;* and the work between is described as a *bay of joisting*. When the space to be spanned is too great for a simple wood-girder, trussed or built-up wooden girders or iron girders are used: the latter have of late come into extensive use, even where simple wood-girders are applicable: see GIRDER. With a given quantity of timber, and a moderate space, the single-joisted F. is the strongest of any. One of its disadvantages is the free communication of sound to the apartment below, unless some additional means of obstructing the sound be adopted.



a, *b*, *c*, *d*, the joists; *e*, *f*, the flooring-boards; *cg* and *dh*, herring-bone strutting.

When first laid, the F. should be rather high in the centre, to allow for settling at the joints; and when settled, it should be perfectly level, for if it rises in the middle, it will exert an outward thrust upon the walls, and if hollow, it will pull inward; but if level, its whole strain is perpendicular. The flooring-boards are usually nailed to the joists, and vary from 1 to 1½ inch in thickness; for common floors they are from 7 to 9 inches wide, but for better floors a width of only 3 to 5 inches is used. The advantage of the narrow boards is, that the shrinkage and warping have not so much effect on the spaces between. The facing of the F. in many old mansions is formed of small pieces of oak carefully inlaid: see PARQUETRY. For other kinds of inlaid fancy floors, see MOSAIC: ENCAUSTIC TILES: CONCRETE. In France, and most of the southern continental countries, where carpets are rarely used, the flooring-boards of the better class of houses are of hard wood, carefully and closely jointed, and these floors are commonly rubbed with bees-wax, and polished. In humbler dwellings, even the bedrooms are paved with tiles, or strong plaster, or concrete; and considering the prevalence of fleas, etc., in such places, they are certainly better adapted for them than deal-boards and carpets. They may be freely sprinkled and even dashed with water in hot weather.—For warehouses where heavy goods are stored, for ball-rooms, etc., special construction is required to adapt the floor to the strain put upon it.

FLOP, v. *flŏp* [another spelling of FLAP, which see]: to hang loose; to bob; to bounce. FLOP'PING, imp. FLOPPED, pp. *flŏpt*.

FLOQUET, *flo kā'* CHARLES THOMAS: statesman: b. St. Jean-de-Luz, France, 1828, Oct. 5. He was educated in the College of Louis-le-Grand, Paris; was admitted to the bar 1851; practiced law for many years; was elected deputy mayor of Paris and member of the national assembly for the dept. of the Seine on the fall of the empire; and was interned at Pau for several months, 1871, for suspected sympathy with the Commune. In 1872 and 74 he was elected to the municipal council, and 1875 was its pres.; 1876 was chosen to the chamber of deputies; 1881 was elected vice-pres. of the chamber; and 1882 was for a short time prefect of the Seine, and was re-elected vice-pres., and elected pres. of the chamber. On the retirement of Pres. Grévy, F. was nominated as a candidate for pres. of the republic. In 1888, Apr., he was called to form a new cabinet, in which he took the offices of pres. of the council and minister of the interior. In July following, he was so far provoked by Gen. Boulanger as to challenge him to a duel, in which he seriously wounded the general with a rapier. 1889, Feb. 14, his ministry was forced to resign by an adverse vote on his revision bill; but Nov. 17 he was re-elected pres. of the chamber for the session 1889–90. He d. 1896, Jan. 18.

FLORA, n. *flō'ră* [L *Flōră*, the goddess of flowers—from *flos, or flōrem*, a flower]: in *bot.*, collective name of all the plants peculiar to a country, area, or to a geological era, as *fauna* denotes all the animals; a work relating to the botany of a region is often termed the Flora of that region. FLO'RAL, a. *-răl*, pertaining to flowers; in *bot.*, seated about the flower-stalk, and near the flower. FLORÉAL, *flō-rā-al* (flowering), 8th month in the calendar of the French Republic, April 20—May 19: it was established 1793, October, and the Republican year dated from 1792, Sep. 22. FLORES'CENCE, n. *-rĕs'ĕns*, the flowering of plants. FLORET, n. *flō'rĕt*, a little flower (see FLOWER). FLORID, a. *flŏr'ĭd* [L. *florĭdus*, flowery]: bright in color; showy; brilliant. FLOR'IDLY, ad. *-lĭ*. FLOR'IDNESS, n. brightness or freshness of color. FLORID'ITY, n. *-ĭ-tĭ*, florid character. FLORIFEROUS, a. *flō-rĭf'ĕr-ŭs* [L. *fĕro*, I bear]: producing flowers. FLORIFORM, a. *flŏr'ĭ-fawrm* [L. *forma*, shape]: flower-shaped. FLOR'IST, n. *-ĭst*, a cultivator of flowers. FLOR'ICUL'TURE, n. *-ĭ-kŭl'tūr* [L. *cultūră*, cultivation]: whatever relates to the culture and arrangement of plants grown for their flowers, or as subjects of taste (see below). FLOR'ICUL'TURAL, a. *-tū-răl*, pertaining to. FLORAL DIAGRAM, representation of the cross-section of a flower. FLORAL ENVELOPES, in *bot.*, parts which envelop or surround the stamens and pistils for the protection of the reproductive organs. They consist of calix and corolla, sometimes with an involucre or bracts external or outside of these. Some plants are without one or both floral envelopes.

FLO'RA: among ancient Romans, the goddess of flowers and of the spring; later identified with the Greek *Chloris*. Her temple was in the vicinity of the *Circus Maximus*. The worship of F. was one of the oldest manifestations of the Roman religious feeling, and is affirmed to have been introduced by Numa. The *Floralia*, or festivals in honor of the goddess, were first instituted B.C. 238 and were celebrated Apr. 28—May 1, with much licentious merriment, prostitutes playing an important part on such occasions. On coins, F. is represented with a crown of flowers.

FLORAMOUR, n. *flōr-a-môr'* [F. *flor*, flower; *amour*, love]: flower begetting love; name formerly applied to different cultivated species of Amaranthus.

FLORAN, n. *flōr'an* [etym. doubtful]: fine-grained tin; either scarcely perceptible in the stone or stamped very small.

FLORASCOPE, n. *flōr'a-skōp* [L. *flos*, a flower; Gr. *skopeo*, I view, I examine]: microscope designed for examining flowers.

FLORENCE, *flŏr'ĕns:* province of Italy, in Tuscany; bordering on Modena, Bologna, Ravenna, Urbino, Arezzo, Siena, Pisa, and Lucca; 2,263 sq. m. It is divided into four districts, F., Pistoja, Rocca San Casciano, and San Miniato, traversed on the e. by the main chain of the Central Apennines, and drained by the Arno river and its numerous affluents. Between the Apennines and the isolated mountains in the e. and s. are extremely fruitful valleys, where wheat, the choicest Tuscan wine, and silk are produced. Cap. Florence. Pop. of prov. (1901) 939,054.

FLORENCE: city, capital of Lauderdale co., n.w. Ala.; on Tennessee river, at the head of steamboat navigation, and on the Louisville and Nashville and the Memphis and Charleston railroads. F. produces coal, iron, and marble, and has cotton and saw mills, iron furnaces and woodenware factories, and 3 weekly papers. The Southern University for Women. State Normal School, and Synodical Female Coll. are here. Pop. (1890) 6,012; (1900) 6,478.

FLORENCE (Ital. FIRENZE): city of Italy, cap. of the former duchy of Tuscany; in the valley of the Arno; lat. 43° 46′ n., and long. 11° 15′ e. It is about 123 ft. above the level of the sea; 60 m. from Leghorn, 40 from Siena. Communal pop. (official, 1901, Feb. 10) 205,589. The Arno, spanned by four fine bridges, divides the city into two unequal parts, the chief of which is on the n. bank. In shape, an irregular pentagon, F. is inclosed by walls about 6 m. in extent, and communicates with the exterior by eight gates, which conduct to thickly peopled suburbs, and a lovely, fertile, and salubrious neighborhood, encircled by sloping hills, and studded with picturesque villas and fruitful vineyards and gardens. F. and her environs, viewed from the heights of Fiesole, appear but one vast city. The influx of population consequent on the establishment here, 1865, of the seat of the Italian govt., necessitated a considerable enlargement of the city, and it is now nearly double its former extent. Many causes render F. a most attractive place of residence to foreigners—a lovely country and healthful climate, cheap living, and the universal courteous intelligence of the people, united to the immense interest of grand historical monuments and collections of art. The massive and austere forms of Florentine architecture impart an air of gloomy grandeur to the streets, for the most part regular and well kept. The chief monuments of the city are Il Duomo, or the Cathedral, the foundations of which were laid with great solemnity 1298. The Florentines, having ambitiously resolved on erecting a monument which for architectural splendor and proportions should outvie all preceding structures, the honor of preparing the design was intrusted to Arnolfo de Cambio da Colle. On his death, Giotto superintended the works; and many eminent architects were employed before this splendid edifice was completed—Brunelleschi, the last, conceived and erected the grand cupola, so much admired by Michael Angelo as to have served him as model for that of St. Peter's. At the side of the cathedral springs up the light and elegant bell-tower, detached, according to the

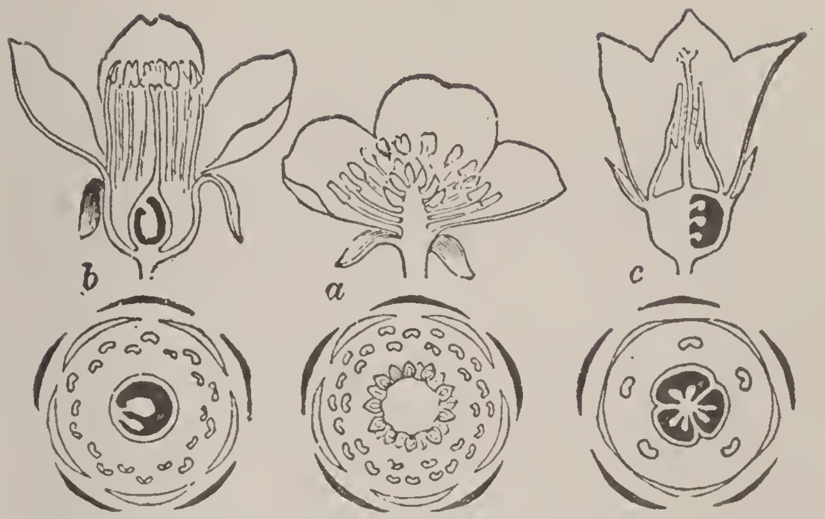
THE CATHEDRAL OF FLORENCE.

custom of the times. In front is the Baptistery of San Giovanni, in form an octagon, supporting a cupola and lantern; all three edifices being entirely coated with a varied mosaic of black and white marble. Three bronze gates in basso-rilievo are a great additional adornment of the Baptistery; the two by Ghiberti have been immortalized by Michael Angelo with the name of Gates of Paradise: see Sgrilli's description. The church of the Santa Croce, the Pantheon of F. (built 1294—architect, Arnolfo), contains monuments to Galileo, Dante, Macchiavelli, Michael Angelo, Alfieri, etc. The church of San Lorenzo was consecrated as early as 393 by St. Ambrose, and rebuilt by Brunelleschi 1425, by command of Giovanni and Cosmo de' Medici. It contains an interesting monumental memorial of Cosmo il Vecchio, bearing inscribed the title *Pater Patriæ,* which had been conferred on his memory by public suffrage the year following his death. In the *Nuova Sagrestia*, or New Sacristry, are the two famous monuments of Michael Angelo to Julian and Lorenzo de' Medici. The figures of these two statues are marvels of deep and living expression, and unsurpassable in their mute and eloquent beauty. The Medicean chapel, gorgeous with the rarest marbles and most costly stones, agate, lapis lazuli, chalcedony, etc., stands behind the choir, and contains the tombs of the Medici family, and those of the grand dukes, their successors. Annexed to the church is the Laurentian Library, with its inexhaustible store of rare MSS., founded by Giulio de' Medici. Bandina has published the catalogue of the Greek, Latin, and Italian MSS.; and Biscioni and Assemani those of the Hebrew and Oriental. Among the numerous palaces, *Il Bargello,* now converted into a prison, is one of the most ancient, and was formerly the abode of the republican magistrate, the Podestà. In 1841, some interesting portraits were brought to light by the removal of a coating of whitewash from the revered features of Dante, Brunetto, Latini, Corso Donati, etc., in the chapel of the palace. The Palazzo Vecchio, seat of the republican government from its establishment till 1530, when it was abolished, is an imposing mass of building, surmounted by a lofty tower 260 ft. high, the great bell of which used to warn the citizens of danger, or summon them to defense. Adjoining the palace is the Piazza del Palazzo Vecchio, a square containing a fine collection of statues, and a noble arcade, the Loggia de' Lanzi, under the porticoes of which are magnificent groups of sculpture (see Rastelli's *Illustrazione Storica del Palazzo della Signoria detto Palazzo Vecchio*); Gli Uffizi, a handsome building between the Palazzo Vecchio and the Arno, founded by Cosmo I., in the first floor of which are deposited the archives of the court of justice and other public offices, also the Magliabechi Library of 150,000 vols. and 12,000 MSS. On the second floor, in a circular suite of 23 rooms, is contained the famous Florentine gallery of art; rich in paintings, engravings, sculpture, bronzes, coins, gems, and mosaics. A splendid apartment, known as the Tribuna, contains the rarest treasures of the collection, and is in itself a wonder of art, with its cupola inlaid with mother of pearl, and its rich marble pavement. The Palazzo Pitti, the modern grand ducal residence, has a superb gallery of paintings, and a collection of 70,000 rare vols. and 1,500 MSS.

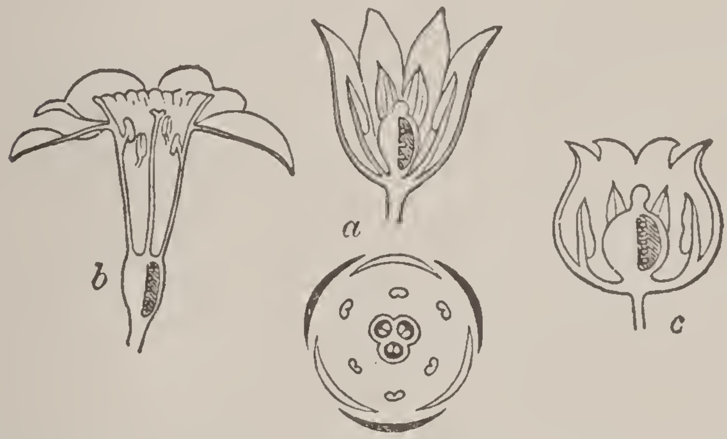
The Palazzo Riccardi, now public property, is much frequented for its fine library. The Palazzo Strozzi is a fine type of Tuscan architecture. Florence abounds in other noticeable public edifices and monuments. The practical and philanthropical institutions also are numerous and excellently organized. The hospital of Santa Maria Nuova contains a college of medicine and surgery which has a European fame. The Acad. of Fine Arts and the Museum of Nat. History afford unlimited resources to the public interested in their collections. There are three hospitals, one lunatic asylum, nine theatres. The Acad. della Crusca is intrusted with the care of sifting and preserving uncorrupted the Italian language. The Academy dei Georgofili was established in the interests of agriculture. F. is the see of an abp., the seat of a prefecture, and of numerous provincial courts, as well as the military headquarters of the region. Its railway communications are ample. The chief industrial occupations of the Florentines are the fabrication of silk and woolen textures, and of straw-plaiting for hats, etc., jewelry, and exquisite mosaics in rare stones. Education is more diffused in Tuscany than in any other Italian state; and the Florentines are famous for their caustic wit and natural gifts of eloquence, as well as for their shrewd thriftiness and unflagging labor. In their moral superiority to other states may be recognized the effects of a better and more upright government than those which existed in most parts of the peninsula previous to the recent union of Italy.

History.—The city of F. sprang originally from Fiesole (q.v.), at the foot of which it lies extended. The inconvenient and hilly site of the Etruscan Fiesole, perched on the crest of an irregular height, rendered the town so difficult of access to the traders who resorted to its market-places with their varied merchandise, that it was at length decreed that they should assemble at the base of the hill, in the fertile plain traversed by the Arno. The few rough shelters erected for the accommodation of these traders may be considered the original nucleus of the important and splendid city of Florence. Such at least is the traditionary history of its origin generally accepted by the Florentine historians. It seems that as early as the time of Sulla there had been a Roman colony here; another was sent after the death of Julius Cæsar, and it soon became a thriving town. The *Florentini* are mentioned by Tacitus, A.D. 16, as sending delegates to Rome, but it was not till the time of Charlemagne that F. began to rise out of obscurity. It was then governed by a political head with the title of duke, assisted by various subordinate officers, elected by the united suffrages of the duke and citizens. In the 11th c., F., and a great part of Tuscany, were bequeathed to Pope Gregory VII., by his friend and partisan the Countess Matilda, who inherited from her mother, the Countess

PLATE 5.



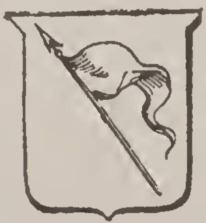
Flowers.—*a*, Vertical section of buttercup (*Ranunculaceæ*), showing *hypogynous* arrangement (*Thalamifloræ*); *b*, Cherry (*Rosaceæ*), showing *perigynous* arrangement (*Calycifloræ*); *c*, Bell (*Campanulaceæ*), showing *epigynous* arrangement (here occurring along with the united petals of *Corollifloræ*). Each section is accompanied by its corresponding ground-plan or ‘floral diagram.’.



Flowers.—*a*, Vertical section of tulip, with parts all separate; *b*, Narcissus, with inferior ovary; *c*, Lily of the valley (*Convallaria*), with united perianth and adherent stamens. The floral diagram of the tulip, however, applies to all.

Flute

Gold Quarter-**Florin** (time of Edward III.).



A banner-**flotant.**

Beatrix, her jurisdiction over the city. Under the protection of Rome, F. speedily adopted the forms and institutions of a free city; and the republican spirit which then arose among the people imparted an impulse to national and individual life, and awoke a spirit of ardent patriotism and splendid enterprise. As early as the 11th c., the Florentines were European traders, and the possessors of grand commercial dépôts in the seaports and cities of France and England, and their skill as workers in gold and jewels had grown proverbial. In proportion as papal preponderance increased in F., that of the empire sank; and in 1113 the citizen forces routed the troops, and slew the delegate of the emperor at Monte Cascioli, near Florence. During the bitter wars between pope and empire, F. and all Tuscany seemed to have been saved from the civil feuds which raged throughout Italy between the contending factions of Guelphs and Ghibellines; the former, adherents of the pope; the latter, of the empire. But in 1215, F. became involved in the great party struggle, owing to a private feud breaking out between two noble families, chiefs of the contending principles. A Guelph noble, Buondelmonti, mortally incensed the Ghibelline family of the Amidei, by breaking off his alliance with a daughter of their house, and contracting marriage with a member of a Guelph family. To avenge this insult, the Amidei appealed to their powerful kinsman, the Uberti, and, in fact, to all the Ghibelline party of Florence. Buondelmonti was stabbed to death as he crossed the bridge of the Ponte Vecchio, and was speedily avenged by the Guelphs in the blood of his enemies. Thus for 33 years was F. distracted by the deeds of bloodshed and violence of these two rival factions, who assumed the names, and adopted the respective causes of Guelph and Ghibelline: see GUELPH AND GHIBELLINE. In 1250, the animosity of these parties seemed somewhat blunted, and public attention was directed to wise internal reforms. Twelve magistrates, or anziani, were appointed in place of the consuls, each of the six sections into which the city was divided being intrusted to two of these magistrates, whose tenure of office was annual. To avoid all local dissensions, two other magistrates, strangers by birth, were elected: one, invested with supreme authority in civil and criminal cases, was called the podestà; the other, with the title of captain of the people, had the chief command of the militia, in which were enrolled all the youth of the state, who were bound, at the call of this magistrate, to join their company fully equipped for fight: 20 companies defended the town, 96 the country. After the death of Emperor Frederick II., the great protector of the Ghibellines, the Guelph or papal party gradually rose in power in F., and during ten years of their predominance, the city ascended in grandeur and prosperity, until it stood not only the first in Tuscany, but one of the first of all Italy. In 1254, the Florentines first coined their noble golden florin, unequalled at the time for beauty: in weight, a drachm, it bore on one side the national emblen, a lily; and on the reverse, the effigy of the popular patron, St.

John the Baptist. It commemorated a period of great success in the annals of F., whose forces had successively humbled the adjoining towns of Siena, Arezzo, Pisa, and Pistoja 1252, and 1254 captured Volterra. In 1260, the standard of civil war was again raised by the Ghibellines of F., who, in league with Manfred of Naples, attacked the Guelphs, and cut their forces to pieces in the sanguinary battle of Monte Aperto. The conquerors entered F. forthwith in the name of Manfred, abolished all trace of the popular institutions, establishing an exclusively aristocratic executive, and even strongly advocated the entire destruction of the city, the hotbed of Guelphism. This barbarous scheme was indignantly repudiated by their own famous leader, Farinata degli Uberti, immortalized by Dante for his patriotism. He declared his intention of heading the Guelphs, were such a sacrilege perpetrated by his own party. Pope Urban IV., French by birth, summoned against the Ghibelline Manfred a French army, led by Charles of Valois, to whom he offered the prospective kingdom of the Two Sicilies. Manfred was defeated and slain in the famous battle of Benevento, and Guelph ascendency was restored anew throughout Italy and Florence. Charles fully restored to the Florentines their internal institutions, and received their offered allegiance for ten years, 1266. In 1282, the *Priori* a new executive power, was established in F.; and in 1293, by the consent of the Priori a higher chief than their own order was elected, with the title of *Gonfaloniere.* In 1300, Dante became one of the Priori, and the former feud was recommenced with new vigor between two factions, who bore the names of Bianchi (Whites) and Neri (Blacks). Their dissensions were, however, interrupted by the appearance of Charles of Valois, sent by Boniface VIII. to restore tranquillity, 1301. Charles espoused the part of the Guelphs or Neri, and sanctioned every outrage on the Bianchi, who were plundered and murdered barbarously, the survivors being exiled and beggared; among these were Dante, and Petracco dell' Ancisa, father of Petrarca. In 1306, Pistoja was besieged, and taken by famine with great barbarity. In 1315, the Florentines met with a severe check from the Ghibellines of Pisa, under the command of Uguccione della Faggiula; and in 1325, were completely defeated by Uguccione's successor in command, the valiant Castruccio Castracani, in the battle of Altopascio. F., weakened by long dissensions, and alarmed by Castruccio's threat of marching on the city, appealed to the king of Naples for aid. They received joyfully an officer of the king, entitled the Duke of Athens, sent as royal vicar; and such was the public demoralization of the moment, they proclaimed him dictator of the republic, unanimously suppressing the offices of priori and gonfaloniere. The intrigues of this ignoble schemer to overturn the republic being discovered, he was ignominiously expelled by a general popular rising, and narrowly preserved his life. An attempt to admit a proportion of the nobles into the government signally failed at this time, and only led to renewed animosity between them and the citizens. This was the last effort of the nobles to secure power. See Macchiavelli, Book II. A terrible pest decimated F. 1348, sweeping off 100,000 of her inhabitants: see Boccaccio, *Decameron*. The chief power of F. about this time seems to have been alternately wielded by the democratic families, the Alberti and the Ricci, and by their patrician rivals, the Albizzi, who, for 53 years, guided the republic in the path of independence and progress. In 1406, the ancient and illustrious republic of Pisa (q.v.) fell under the sway of F., after a most heroic resistance. From 1434, the history of F. is intimately bound up with the House of Medici, whose influence supplanted that of the Albizzi: see MEDICI. The Medici were repeatedly banished from F., in consequence of their aiming at sovereign power; and to their intrigues F. owes her final loss of republican rights and institutions. Pope Clement VII., of the House of Medici, formed a league with Emperor Charles V., by which the liberties of F. were to be extinguished, and the sovereign power to be invested in the pope's bastard son, Alexander de' Medici. In 1529, Sep., an army of imperialists, under the Duke of Orange, entered Tuscany; and 1530, Aug. 8, the siege of F. terminated, after a defense of unexampled devotion and bravery on the part of the citizens. Thus fell the name and form of the republic of F., quenched in the best blood of the city, a sacrifice to a renegade pope, who employed both foreign robbers and internal traitors to destroy and humiliate the city of his birth. From this period, F. loses her distinctive history, and is known only as capital of the grand duchy of Tuscany, Pope Clement having conferred on Cosmo de' Medici the ducal dignity. Some idea of the splendor and prosperity of F. as a republic may be had from the fact, that her capitalists were so enormously wealthy, that they supplied the chief sovereigns of Europe with funds; her manufactures of wool, silk, and gold brocade were exported throughout the world; and besides home centres of commerce, she possessed great commercial establishments in all the countries of Europe. This wonderful prosperity the Florentines owed solely to their indomitable spirit of enterprise. Florence was until 1871 the cap. of the new kingdom of Italy; since that year the capital is Rome. See Perrens, *Histoire de F.* (5 vols. 1877–80).

FLORENCE, COUNCIL OF: continuation of the council of Bâle, opened 1431, Dec. 14, transferred to Ferrara 1438, Jan. 8, and removed to F. 1439, Jan. It was the 17th œcumenical council recognized by the Rom. Cath. Church, and was virtually closed 1442. It was originally called by Eugenius IV. for the purpose of reuniting the Eastern and Western Churches, and for some time the pope maintained an attitude of hostility to the reformatory measures proposed; but through a compromise effected 1434 he took the direction of the council into his own hands. After the removal of the council to F., the eastern prelates increased greatly in numbers, and the Greek emperor, John Palæologus, anxious to gain the assistance of the West in his struggle with the Turks, personally urged the bps. to come to an understanding on the points that still kept the two churches apart. These were (1) the addition of *filioque* to the Nicene Creed; (2) the use of unleavened bread in the Eucharist; (3) purgatory; (4) papal supremacy. In 1439, June 8, the first was agreed to; a month later, the other three were settled by compromise; and, on July 6, Cardinal Cesarini proclaimed the agreement in the presence of the pope and the Greek emperor and his bps. In 1443, the patriarchs of Alexandria, Antioch, and Jerusalem united in a formal denunciation of the council and its act of reconciliation. A portion of the original council continued to sit in Bâle till 1448, then removed to Lausanne, and was closed 1449, Apr. 25. It elected an anti-pope, Felix V. 1440, who resigned 1449.

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